ISSN: 2467-4885

ASIAN INTELLECT

FOR ACADEMIC ORGANIZATION AND DEVELOPMENT INC.

VOLUME 29 DECEMBER 2023

RESEARCH AND EDUCATION JOURNAL

The Asian Intellect Research and Education Journal
is a refereed journal and is published by the

Asian Intellect for Academic Organization and Development Inc.

with
SEC REGISTRATION NO. CN201539886
and office address at
BLOCK 63, LOT 20, FIESTA COMMUNITIES,
SAN RAFAEL, TARLAC CITY

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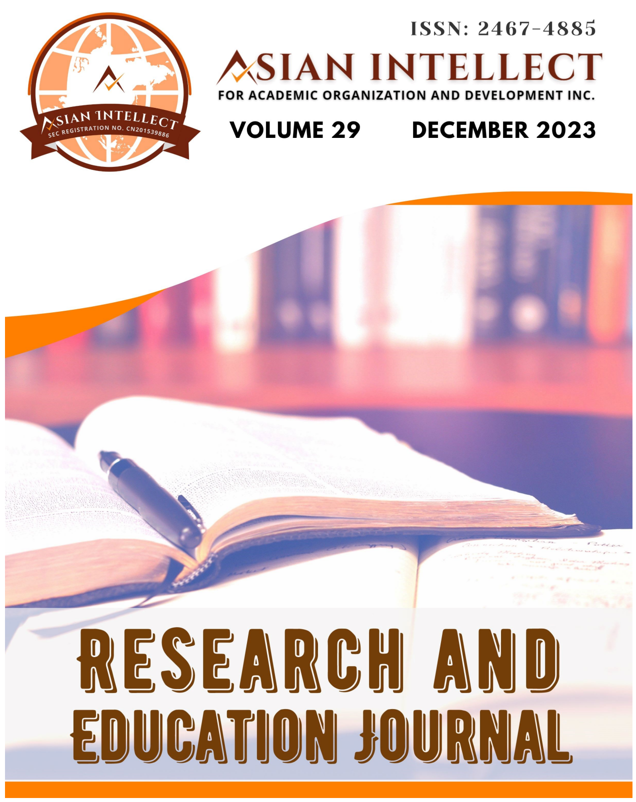
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TABLE OF CONTENTS

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ANTIMICROBIAL SUSCEPTIBILITY PROFILE OF STAPHYLOCOCCUS AUREUS ISOLATED FROM GLOVES AND MICROSCOPES USED BY MEDTECH STUDENTS

Glenn Gabriel Abellana, Tilna Joy Naraja, Ericka Peramide
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ABSTRACT

Antimicrobial resistance, a major concern in both past and present times, poses a significant threat. *Staphylococcus aureus*, a gram-positive coccus, causes various human diseases, including Methicillin-resistant *Staphylococcus aureus* (MRSA) which is challenging to treat. The researchers investigated the prevalence and antimicrobial susceptibility profile of *Staphylococcus aureus* in gloves and microscopes used by thirty third- year medical technology students, chosen through convenient sampling, under Bacteriology Course at the Microbiology Laboratory of the College of Medical Technology at the University of Cebu-Banilad. Moreover, the data underwent quantitative descriptive statistical analysis. The prevalence of Staphylococcus aureus was quantified statistically in terms of frequency and percentage. The researchers used the Wilcoxob-Mann-Whitney test and one-way ANOVA in determining the significance of the differences between antibiotics. In the study, the researchers isolated 9 Staphylococcus aureus and found that *Staphylococcus aureus* is more prevalent in gloves than in microscopes, with 7 from the gloves and 2 from the microscope. Gentamicin (100%) has the most number of susceptible isolates while Oxacillin (67%) has the most number of resistant isolates. Multridrugresistant isolates were also detected with a prevalence rate of 56% from the total *Staphylococcus aureus* isolates.

Keywords: Antimicrobial resistance, Staphylococcus aureus, Methicillin-resistant Staphylococcus aureus (MRSA), Susceptible Isolates, Resistant Isolates, Multridrugresistant Isolates, Microbiology Laboratory

INTRODUCTION

Staphylococcus aureus is an opportunistic pathogenic microorganism that is one of the leading causes of bacterial infection in the public health system, creating havoc inside the patient's body. The study conducted by the Antimicrobial Resistance Collaborators (Antimicrobial Resistance Collaborators, 2022) states that Staphylococcus aureus is one of the most bacterial pathogens that cause significant deaths in 135 countries, with higher than 1 million deaths and most death cases associated with individuals beyond the age of 15 years old, recorded in the year 2019. The persons affected by this microbial microorganism would be those with skin-to-skin contact or physical contact with the contaminated surface, immune-compromised patient, hemodialysis, pediatric patient, and advanced age (Gebreab et al., 2019). A strain of *Staphylococcus aureus* known as methicillin-resistant *Staphylococcus aureus* [MRSA] has developed a resistance to many medications used to treat typical staph infections. MRSA is listed as one of the top pathogens in Southeast Asia and is responsible for more than 100,000 deaths, contributing to the global antimicrobial resistance burden (Farook et. al., 2022). The acquisition of potential transmission of nosocomial MRSA infection would be due to the following reasons: person-to-person physical contact, physical contact of a patient via hands, medical equipment of the health care workers, and clothes (Alcazaren et al., 2020). In addition, according to the Canadian Centre for Occupational Health and Safety [CCOHS] (2018), hospital workers or other healthcare facility patients, and immunocompromised people are at higher risk of getting infected by MRSA.

Alarmingly, MRSA has occurred in healthcare settings and the broader community, such as in healthy people. This MRSA is known as community associated MRSA [CA-MRSA], which often begins as a painful skin boil and is usually spread by skin-to-skin contact (Mayo Clinic, 2020). In the study conducted by Mendez et al. (2013), strains of S. aureus are present in an essential proportion in the nostrils and hands of medical students. Although hand washing is vital for preventing infection, *S. aureus* was found on healthcare professionals' hands even after using alcohol, chlorhexidine, or soap and water, indicating that *S. aureus* is a particularly persistent bacterium. Moreover, *Staphylococcus aureus* is ubiquitous, found everywhere in the environment. It is present mainly in public and private hospitals, such as in nurse's stations, prosthetic device infections, and other healthcare facilities. If untreated, Staphylococcus aureus could cause life-threatening infections such as toxic shock syndrome, pneumonia, and sepsis (Taylor & Unakal, 2022). The emergence of *Staphylococcus aureus* in the community has been alarming, making it a health concern. However, the studies presented came from outside the Philippines. Awareness of the possible risks of Staphylococcus aureus acquired in the community is essential, especially for Medical Technology students who are the most exposed to different microorganisms in the laboratory.

The study was pillared with various theories on detecting Staphylococcus aureus in gloves and microscopes used by Medical Technology students in the Microbiology Laboratory and how these correlates in determining the transmittance, prevalence, and proper treatments and prevention methods of microbial contamination. The study's leading theory is the Germ Theory of Diseases which states that the invasion of microorganisms that are difficult to be seen by the naked eye is the cause of certain diseases. Some diseases are brought on by microorganisms like bacteria, viruses, fungi, or protists that invade our bodies. Due to their small size, these microorganisms must be magnified using a microscope to be viewed clearly. They multiply and proliferate inside the host's body, resulting in infectious diseases (Dura, 2023). Another theory is the Epidemiological Triad, which is among the simplest models of disease causation. In this model, disease occurs when an agent interacts with a susceptible host in an environment that facilitates agent transmission from a source to that host. The disease is caused by interactions between the agent, host, and environment in various complex ways. The balance and interactions of these three components vary depending on the disease (Balasubramanian, 2023). Lastly, the importance of cleanliness, the absence of germs, and the provision of facilities to achieve this absence are what make up sanitation theories. According to this theory, infectious diseases originate in microorganisms. In this sense, sanitation includes different types, namely: Basic Sanitation, Container-Based Sanitation, Community-Led Total Sanitation, Dry Sanitation, Ecological Sanitation, Emergency Sanitation, and Environmental Sanitation. All these are important to the prevention of disease, the extension of one's life span, and the elimination of bacteria that are already present (Kodarkar, 2023).

The study investigated the antimicrobial susceptibility profile of *Staphylococcus aureus* in gloves and microscopes used by Medical Technology students. The study's findings was used in dealing with the possible risk of spreading *Staphylococcus aureus* in the school. Moreover, this study specifically does the following:

1. Determine which of the two variables (gloves and microscopes) *Staphylococcus aureus* is more prevalent.
2. Assess the antimicrobial susceptibility of *Staphylococcus aureus* isolated from gloves and microscopes to selected known antibiotics;
3. Determine the prevalence of multi-drug resistant *Staphylococcus aureus* isolated from the gloves and microscopes used by medical technology students in the Microbiology laboratory

METHODOLOGY

Research Design, Environment, Subjects

The study used a descriptive approach, using isolated samples from gloves and microscopes exclusively used by thirty (30) third-year medical technology students, selected through convenient sampling, after an extended stay in the Microbiology Laboratory of the College of Medical Technology at the University of Cebu - Banilad. Thus, identifying the antimicrobial susceptibility pattern by using the standardized Kirby Bauer disk diffusion method in the Mueller–Hinton's agar, a non-differential and non-selective medium following the Clinical and Laboratory Standard Institute [CLSI], is to determine whether *Staphylococcus aureus* develops resistance or sensitivity patterns to a few selected antibacterial agents.

Research Instrument

The instrument used to determine The Antimicrobial Susceptibility Profile of *Staphylococcus aureus* was the Clinical and Laboratory Science Institute's M100 manual 33rd edition. This manual was used to interpret the zone of diameter of each antibiotic during the testing. The study used observation as one of the crucial ways to collect data. The researchers used vernier calipers as a primary tool to measure the diameter of the zone of inhibition. The raw data was recorded using pencil, ball pens, and paper.

Data Collection and Treatment

Each student had one (1) pair of gloves. The gloves are used as personal protective equipment by the students conducting experiments in the laboratory, while the microscopes are generally used for laboratory activities. To control the study and avoid biases, gloves and microscopes were not used in other laboratories. The gloves will then be swabbed once they are done performing their laboratory work, while the researchers also swab the microscopes.

Samples were collected by rubbing sterile swabs moistened with NSS. All the samples collected from the gloves and microscopes were inoculated in a tryptic soy broth and incubated at 37°C for 18–24 hours. before it is encoded and analyzed. Subculture from the broth was performed on 5% blood agar. Culture plates were incubated at 37°C for 24–48 hours. S. aureus was identified using standard methods based on colony morphology, Gram stain, catalase test, slide coagulase, and tube coagulase test. The isolated S. aureus was tested for antimicrobial resistance using the Kirby Bauer disk diffusion method with antibiotic disks on Mueller- Hinton agar following Clinical and Laboratory Standards Institute [CLSI] guidelines. A bacterial suspension is equivalent to the 0.5 (1.5×10^8 CFU/mL) McFarland turbidity standard prepared for inoculation. The inoculum was transferred to Muller- Hinton agar (Difco), and standard antimicrobial disks representing multiple drug classes were subsequently set; Gentamicin (aminoglycosides) (10 µg), Azithromycin (macrolides) (15 µg), Oxacillin (Penicillinase stable penicillin) (1µg), Rifampin (ansamycins) (15µg), tetracycline (tetracycline) (30µg) and Vancomycin (glycopeptides) (30 µg), then incubated at 35 ± 2 °C for 24 hr. After incubation, the diameter of the zone of inhibition was recorded to the nearest millimeter of each disc using a vernier caliper and then classified as sensitive, intermediate, or resistant according to the manufacturer's interpretative chart. The researchers also identify patterns wherein the sample resists more than one antibiotic.

The researchers manually computed the prevalence of Staphylococcus

aureus isolated from gloves and microscopes used by medical technology students in the Microbiology laboratory using frequency and percentage. Frequency and percentage were used to determine susceptible, most resistant antibiotics and the MDR pattern against the isolated Staphylococcus aureus. Wilcoxon-Mann-Whitney test and one-way ANOVA through IBM SPSS Statistics 23 were also used to determine if there is a significant difference between seven antibiotics and had it consulted through their statistician.

RESULTS AND DISCUSSION

The data collected were subjected to descriptive statistics, and the findings are presented in tabular form after being analyzed to facilitate reading and understanding. It also provides the analysis and interpretation of the data organized according to the research questions enumerated above.

Prevalence of Staphylococcus aureus Isolated from Gloves and Microscopes

Table 1: Number and Percentage of Staphylococcus aureus isolated from the Microbiology Laboratory

Source	Positive for *S. aureus*	Negative for *S. aureus*	Number of samples tested	Positivity rate for a specific source (n=30)	Total positivity rate (n=60)
Gloves	7	23	30	23%	13%
Microscopes	2	28	30	7%	2%
Total	**9**	**51**	**60**		**15%**

The total positive isolates gathered from both the 30 gloves and 30 microscopes were nine (9), with seven (7) from the gloves and two (2) from the microscopes, respectively. On that account, 23% of the gloves are positive for *Staphylococcus aureus*; that is 13% out of the 60 total bacterial isolates. On the other hand, 7% of the microscopes were also positive for Staphylococcus aureus, which makes it 2% of the total bacterial isolates. Therefore, only 15% of the total isolated bacteria are positive for Staphylococcus aureus, and it is more prevalent in gloves than in the microscopes used by Medical Technology students. A potential cause of the high cases of *S. aureus* in gloves is the lack of proper decontamination after doffing. These contaminated gloves could serve as a fomite transmitting pathogenic organisms with a bacterial transfer of 16% to 19.5%, and these increases significantly from all glove types with bacterial exposure, thus, could pose a possible risk of bacterial infection through bacterial contamination in gloves.

Percentage of isolates that is susceptible, intermediate, or resistant to different antibiotics

Table 2: Percentages of S. aureus from gloves and microscopes that are susceptible (S), intermediate (I), and resistant (R) to antibiotics. Breakpoints were based on CLSI standards (in mm)

Antibiotics	Breakpoints	Susceptible (S)	Intermediate (I)	Resistant (R)
Rifampin	S= $\geq$16 I=15-13 R=$\leq$12	4 (44%)	0 (0%)	5(56%)
Doxycycline	S= $\geq$20 I=19-17 R=$\leq$16	7(78%)	1(11%)	1(11%)
Azithromycin	S= $\geq$18 I=17-14 R=$\leq$13	6 (67%)	2(22%)	1(11%)
Gentamicin	S= $\geq$15 I=14-13 R=$\leq$12	9(100%)	0 (0%)	0 (0%)
Vancomycin	S=$\geq$12 I= R=$\leq$9	7 (78%)	0 (0%)	2(22%)
Oxacillin	S=>10 I=1 R=<10	3 (33%)	0 (0%)	6(67%)
Tetracycline	S= $\geq$19 I=18-15 R=$\leq$14	6 (67%)	2(22%)	1(11%)

Oxacillin and rifampin exhibited the most percentage of resistance to the total positive *Staphylococcus aureus* from gloves and microscopes at 67% (6/9) and 56% (5/9). The lowest resistance was observed for vancomycin at 22% (2/9), doxycycline, azithromycin, and tetracycline at 11% (1/9). No indicative resistance to gentamicin. Furthermore, tetracycline and azithromycin intermediate isolate prevalence rate of 22% (2/9), and doxycycline at 11% (1/9). Also, there was no indicative intermediate presence of gentamicin, oxacillin, vancomycin, and rifampin. As for positive isolates susceptible to antibiotics, gentamicin shows the highest percentage of susceptibility at 100% (9/9). Antibiotics such as vancomycin and doxycycline also show high susceptibility at 78% (7/9), azithromycin and tetracycline at 67% (6/9).

Isolates resistant to oxacillin indicate the presence of Methicillin- resistant *Staphylococcus aureus* [MRSA]. MRSA are another strain of *Staphylococcus aureus* responsible for severe infections that are difficult to treat and manage. With this, there is a potential risk of community-acquired infection. The same table shows a high susceptibility to vancomycin, indicating that it is an effective antibiotic against *Staphylococcus aureus*.

Number and Multidrug-Resistant Patterns of Isolated S. aureus

Table 3: Number of S. aureus isolates that are resistant to multiple antibiotics

Number of antibiotics	Number of *Staphylococcus aureus* (n=9)
0	2
1	2
2	3 (MDR)
3	1 (MDR)
4	1 (MDR)

CDC defines multi-drug resistant isolate when it is resistant to more than one antibiotic in three or more different classes. In the table above, 5 of the 9 *Staphylococcus aureus* isolates are considered multi -drug resistant. Of those, two isolates are resistant to 2 antibiotics. 2 isolates are resistant to 3 antibiotics, while another one isolate is resistant to 4 antibiotics. This means that 56% of isolates positively identified as *Staphylococcus aureus* are considered multi-drug resistant isolates.

Table 4: Antibiotic resistance pattern among *Staphylococcus aureus* isolates from gloves and microscopes

Number of antibiotics	Resistant Pattern	Number of *Staphylococcus aureus* (n=9)
0	-	2
1	OX TE	1 1
2	RA-OX	2
3	RA-DO-OX RA-VA-OX	1 1
4	RA-AZ-VA-OX	1
	Total	**9**

Note: OX= Oxacillin, TE= Tetracycline, RA= Rifampin, DO= Doxycycline, VA= Vancomycin, AZ= Azithromycin

Based on the data gathered, the most common multi-drug resistant patterns are Rifampin and Oxacillin, accumulating a total percentage of 22%. Other multi-drug resistant patterns only have one isolate each. These include Doxycycline and Oxacillin combination, Rifampin, Doxycycline and Oxacillin combination, and Rifampin, Azithromycin, Vancomycin, and Oxacillin pattern.

Statistical Treatment

Table 5: Test of Significant Difference between the Prevalence of *Staphylococcus aureus* Isolated in the Gloves and Microscopes Used by Medical Technology Students in the Microbiology laboratory

Variable	p-value	Decision	Interpretation
gloves and microscopes	0.303	Do Not Reject Ho	Not Significant

Table 5 shows the Wilcoxon-Mann-Whitney to test the significant difference between the prevalence of Staphylococcus aureus isolated in the gloves and microscopes used by medical technology students in the Microbiology laboratory. The p-value of 0.303 is more than 0.05, which does not reject the null hypothesis. In conclusion, there is no significant difference in the prevalence of *Staphylococcus aureus* isolated in the gloves and microscopes.

Table 6: One-Way ANOVA Using the Zone Diameters from the Different Antibiotics

Variable	p-value	Decision	Interpretation
antibiotics	0.003	Reject Ho	Significant

Table 6 presents one-way ANOVA using the zone diameters from the different antibiotics. The p-value of .003 is less than 0.05, and it rejects the null hypothesis. Therefore, there is a significant difference in antimicrobial susceptibility between the seven antibiotics.

Summary of Findings

The gloves (13%) were more prevalent with Staphylococcus aureus than the microscopes (2%). Oxacillin (67%) and rifampin (56%) had the highest resistances, while the least were vancomycin (22%), doxycycline (11%), azithromycin (11%), and tetracycline (11%). There was no indicative resistance to gentamicin. The prevalence of multi-drug resistance was 56%, with 33% being resistant to two (2) antibiotics, 11% being resistant to three (3) antibiotics, and another 11% being resistant to four (4) antibiotics. The most prevalent multi-drug resistant pattern was the combination of rifampin and oxacillin (22%), while the rest of the patterns only had one (1) isolate each. These include the Doxycycline-Oxacillin combination, the Rifampin-Doxycycline-Oxacillin combination, and the Rifampin- Azithromycin-Vancomycin-Oxacillin combination. With the data gathered, indicative measures for appropriate decontamination of gloves and proper utilization of microscopes should be taught in schools and practiced inside the laboratory to mitigate the spread of resistant strains of Staphylococcus aureus.

CONCLUSION

The findings of this study indicate that the gloves and microscopes used by the Medical Technology students in the Microbiology Laboratory of the University of Cebu - Banilad campus contain antibiotic-resistant and multi- drug resistant *Staphylococcus aureus*. The isolates were resistant to different antibiotic classes, which have various classifications and modes of action. On the other hand, S. aureus is still sensitive to some antibiotics, which stipulates that these are still effective against the said bacteria. Staphylococcus aureus in the gloves and microscopes is worth noting because this poses a potential risk of community-acquired infections in schools.

ACKNOWLEDGMENTS

The researchers offer their deepest gratitude to the University of Cebu College of Medical Technology Faculty and Panel, Subject Head, Jeson A. Bustamante, LPT, EdD, and their Research Adviser, Albert Christian C. Borbon, RMT, MD, DPSA, parents, and friends, for the guidance and support to work on this research study.

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EFFECTIVENESS AND ACCEPTABILITY OF INNOVATED BATTERY-OPERATED WIRING INSTALLATION SIMULATION (BOWIS) DEVICE FOR BASIC ELECTRICAL CIRCUIT INSTRUCTION

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ABSTRACT

The aim of this study is to innovate a battery operated wiring installation simulation device in order to augment the scarcity of instructional materials in electrical technology to increase the competencies of students. The research utilizes descriptive method involving two respondent groups, the 10 professors and instructors and 40 students was conducted in Surigao City. Both respondent groups examined the effectiveness in terms of functionality, efficiency and usability and also on the device acceptability in terms of its reliability, influence, dependability and cost. It is also examined to the effect on the performance of the students in terms of using the traditional way in comparison of using the device. Result revealed based on perceptions of the respondents on the device rated as very effective and also highly acceptable. Thus, based on the findings, it is concluded that the innovated device for electrical technology has a great effect to the performance of the students. It is thereby recommended that the innovated device be adopted in instruction particularly on basic electrical circuits wiring installation.

Keywords: Battery operated, Basic wiring Installation, Simulation Device, Instructional material, Perceptions

INTRODUCTION

The demands of the times have fostered everyone in all fields and at all levels an unprecedented adjustment to technological changes, so persuasive making life increasingly reliant upon it. These persistent and urgent demands are reinforced by legitimate concerns to include educational goals to produce or develop a fully functioning resource material indicating strongly to innovations and creativity.

Saga (2006), pointed out that technology innovation is a process wherein new technologies are developed and apply for widespread use also utilizing of all other available resources to introduce or applying something better than the existing state of the art. These new technologies and innovations are products creatively applying mental and physical efforts to achieve the desired end. It is a result of man's knowledge to continue to find resources to produce tools, apparatus, devices, and machinery which will be employed to solve real-world problems (http://en.wikipedia.org/wiki/Technology, 2009).

Adequate instructional materials" refer to a sufficient number of student or site licenses or sets of materials with intellectual content that are designed to be the primary tool for assisting in the instruction of a subject or course. These resources may be provided in a variety of forms, bound, unbound, kit, or package form, and may consist of hard backed or soft backed textbooks, electronic content, consumables, learning laboratories, manipulative, electronic media, and com.

It is an experience in a shop room where students are doing electrical circuit connection activity, and the risk is always present that students will be electrocuted, and the supply voltage utilized is high enough that it can sometimes save the life of any student. This device is so inexpensive that all of the materials may be found in the local store. Unlike the traditional method of executing the electrical circuit connection activity, where portion of the material used cannot be reused for the following activity, the device is not expensive.

The researcher was prompted by the concept stated in the preceding statement to create and develop a new innovative equipment known as the battery operated wire installation simulation (BOWIS) device. This design is used to simulate electrical activity for greater safety because it is low voltage (from 220 VAC to 12 VDC) and simple to operate.

STATEMENT OF THE PROBLEM

This study attempts to assess the effectiveness and acceptability of innovated battery operated wiring installation simulation (BOWIS) device for basic electrical circuit instruction.

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

1. What is the perception of the respondents as to:
   1.2 level of effectiveness, and
   1.2 level of acceptability?
2. What is the effect of the electrical technology utility model to the student's performance?
3. Based on the findings, what recommendation for the device can be drawn?

METHODOLOGY

Research Design

The study utilized the combination of descriptive- developmental method. Design and development was used since the study dealt with the process of circuit design and the fabrication of the device. Experimental method was also used since the circuit of the light emitting diode (LED) is done for it will illustrate how electrons flow in a circuit. The descriptive method is used because it involved the collection of data concerning the respondents' perception on the design of the device.

Research Environment

The actual fabrication of the device and the conduct of the research was primarily done at the electrical shop of the Surigao Norte State University, City Campus, located at Narciso Street, Surigao City in the Province of Surigao del Norte.

The projected time for the design and development was ten (10) months; one (1) month for specification analysis, one (1) month for designing, one (1) month for budgetary cost analysis, one (1) month for verification and testing, two (2) month for result analysis for fabrication, one (1) month allotted for fabrication, one (1) month for testing and two (2) month for documentation of the research work.

The materials used in the study were collected from local market establishment at different places where the materials are available.

Research Respondents

The respondents of the study are 10 Electrical Professors and Instructors and 40 On-the Job-Training (OJT) Students of the said University.

Table 1. Frequency Distribution of Respondents
N=50

Respondents	Total Sample Population	%
Electrical Professor	6	12
Electrical Instructors	4	8
Students (On-the Job- Training)	40	80
Total	**50**	**100**

The above table shows the distribution of the respondents. The stratified random sampling technique was used in which the population was divided into non-overlapping sub population called strata and the percentage of every group. The total of 50 were the only groups of respondent who were qualified to rate the project.

Research Instrument

The adopted questionnaire from previous related studies was used to gather the necessary data and information of the study.

The questionnaire contained, (1) the profile of the respondent, (2) the perception of the respondents as to; (a) level of effectiveness and (b) level of acceptability,(3) What is the effect of the electrical technology utility model to the student's performance?(4) Based on the findings what low voltage electrical installation simulator: utility model can be develop?

The respondents has answered and selected their best choices as to their perception on the proposed device. There are two sets of questionnaire on the third problem for comparison of the two methods used in electrical installation.

Data Analysis

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

RESULTS AND DISCUSSIONS

Perceptions of the Respondent Groups on The Effectiveness and Acceptability of the Device

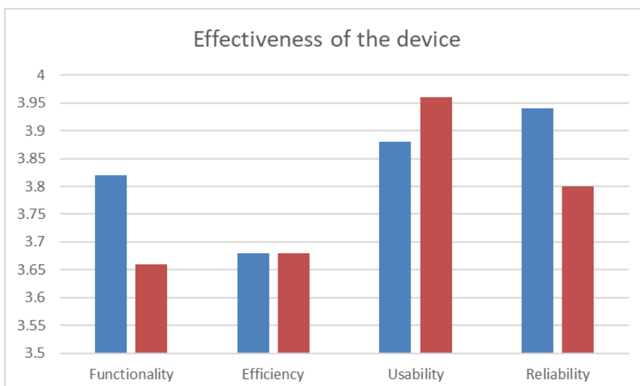

Figure 1. Perceptions of the respondent groups on the effectiveness of the device

The graph presents ratings for effectiveness in two different roles, "Professor" and "Student," across four criteria: Functionality, Efficiency, Usability, and Reliability. The ratings are provided on a scale where higher values indicate a higher level of perceived effectiveness. Professors gave a rating of 3.82 for functionality, suggesting that they perceive the system or service as effective in terms of its basic functions. While students rated functionality slightly lower at 3.66, indicating that they may have a slightly less favorable view of the system's basic functionality compared to professors.

In addition, both professors and students rated efficiency equally at 3.68, indicating that both groups perceive the system or service as equally effective in terms of efficiency. Professors rated usability at 3.88, suggesting that they find the system or service relatively easy to use and navigate. On the other hand, Students rated usability slightly higher at 3.96, indicating that they may find the system even more usable and user-friendly compared to professors.

Professors rated reliability at 3.94, indicating that they perceive the system or service as highly reliable. Students rated reliability slightly lower at 3.80, suggesting that while they still find the system reliable, their perception is slightly less favorable compared to professors.

Overall, this graph suggests that both professors and students generally perceive the system or service as effective, but there are some variations in their perceptions across the evaluated criteria.

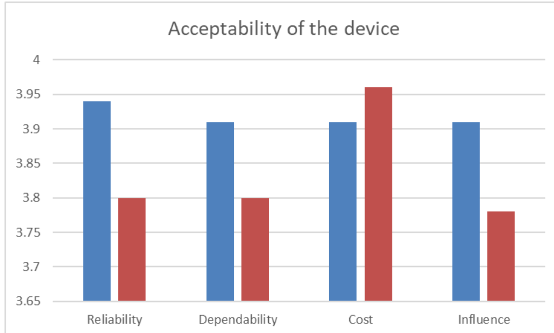

Figure 2. perceptions of the respondent groups on the acceptability of the device

The graph shows and presents ratings for acceptability in two different roles, "Professor" and "Student," across four criteria: Reliability, Dependability, Cost, and Influence. The ratings are provided on a scale where higher values indicate a higher level of acceptability. The acceptability rating for reliability is 3.94, which indicates a relatively high level of acceptability. This suggests that professors find the system or service under consideration to be reliable and dependable. While Students rated reliability slightly lower at 3.80, indicating that they perceive the system or service as reliable but slightly less so compared to professors' ratings.

The acceptability rating for dependability is 3.91, which is also quite high. Professors have a favorable view of the system or service's dependability. Similar to reliability, students rated dependability slightly lower at 3.80. While still relatively high, it suggests that students may have slightly lower confidence in the system's dependability compared to professors.

Professors' acceptability rating for cost is 3.91, indicating that they find the cost of the system or service to be reasonable. Students rated cost slightly higher at 3.96, suggesting that they may be more accepting of the cost associated with the system or service. The acceptability rating for influence is 3.91, indicating that professors perceive the system or service as having a reasonably influential or impactful role. Students rated influence slightly lower at 3.78, suggesting that they may perceive the system or service as having a somewhat lesser impact compared to professors.

Overall, this graph suggests that both professors and students generally find the system or service to be acceptable across the evaluated criteria. However, there are some subtle differences in their perceptions. Professors tend to rate the system slightly higher in terms of reliability, dependability, and influence compared to students, while students are slightly more accepting of the cost associated with the system. These differences in perceptions may be attributed to the distinct roles and perspectives of professors and students. Professors might place a higher value on reliability, dependability, and influence as they likely interact with the system or service in a different capacity compared to students. Students, on the other hand, may weigh the cost factor more heavily, especially if they are the end-users or beneficiaries of the system.

Performance of the Students in Using the Device Based on Different Competencies

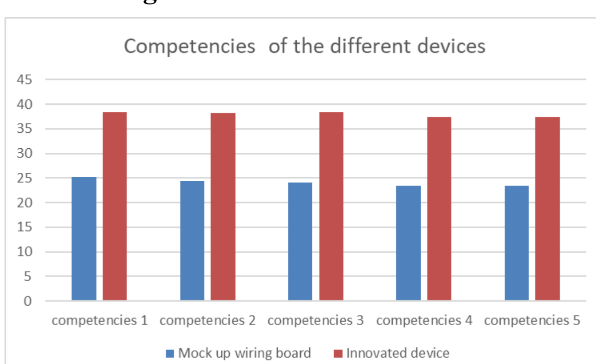

Figure 3. Performance of students using the Mock –Up Wiring Board and the Innovated Device in all competencies

The graph appears to compare different competencies related to "Mock-up Wiring Board" and "Innovated Device" across five categories (competencies 1 to 5). The values in the table likely represent some form of measurement or assessment related to these competencies. It also appears to represent the competency scores of individuals or groups in two different areas: "Mock-up Wiring Board" and "Innovated Device."

The graph allows for a direct comparison of competencies between the two areas. It suggests that, on average, competencies related to the "Innovated Device" tend to have higher scores across all five competencies (1 to 5) compared to competencies related to the "Mock-up Wiring Board." Consequently, The data can be used to identify specific areas of strength and weakness in both "Mock-up Wiring Board" and "Innovated Device" competencies. For example, if "Competencies 1" and "Competencies 2" are critical for the task at hand, then "Innovated Device" appears to have a clear advantage. Similarly, the results can guide decisions related to training and development. For instance, if competencies related to the "Mock-up Wiring Board" are deemed essential, efforts may be directed towards improving these competencies through targeted training programs. Also, Depending on the context, resource allocation decisions can be made. If the "Innovated Device" competencies are more critical for a project, resources may be allocated accordingly. Moreover, Organizations and individuals can use these competency assessments as benchmarks for continuous improvement. Regular assessments can help track progress and identify areas that need further development.

Furthermore, It may also be useful to conduct statistical analysis or gather qualitative feedback to better understand the reasons behind the competency scores and to identify potential areas for improvement.

Table 2. Significant Effect of the Innovated Device to the Student's Performance

Indicators	Using Wiring Board		Using the Model		t	p-value	Interpretation
	X	SD	X	SD			
Competency 1	21.15	2.05	38.43	1.26	1.223	<.001	Very High Significant
Competency 2	24.40	2.01	38.28	1.20	1.406	<.001	Very High Significant
Competency 3	24.03	2.48	38.33	1.12	1.109	<.001	Very High Significant
Competency 4	23.38	1.61	37.40	1.22	1.930	<.001	Very High Significant
Competency 5	23.35	1.92	37.40	1.28	1.490	<.001	Very High Significant

Legend:
1. Connect a single switch to the circuit to control a lamp in one location.
2. Connect a three-way switch to the circuit to control a lamp in one location.
3. Connect four-way switch to the circuit to control a lamp in one location.
4. Connect control switches to the circuit to control a lamp in two locations.
5. Connect control switches to the circuit to control a lamp in three locations.

As revealed in the Table the significant effect of innovated device to the student's performance; Competency 1 in Using the Wiring Board has a weighted mean of 21.15 with standard deviation of 2.05 while in Using the Model has a weighted mean of 38.43 with standard deviation of 1.26, the computed p -value is less than 0.001 which is describe as Very High Significant; Competency 2 in Using the Wiring Board has a weighted mean of 24.40 with standard deviation of 2.01 while in Using the Model has a weighted mean of 38.28 with standard deviation of 1.20, the computed p-value is less than 0.001 which is describe as Very High Significant; Competency 3 in Using the Wiring Board has a weighted mean of 24.03 with standard deviation of 2.48 while in Using the Model has a weighted mean of 38.33 with standard deviation of 1.12, the computed p-value is less than 0.001 which is describe as Very High Significant; Competency 4 in Using the Wiring Board has a weighted mean of 23.38 with standard deviation of 1.61 while in Using the Model has a weighted mean of 37.40 with standard deviation of 1.22, the computed p-value is less than 0.001 which is describe as Very High Significant; Competency 5 in Using the Wiring Board has a weighted mean of 23.35 with standard deviation of 1.92 while in Using the Model has a weighted mean of 37.40 with standard deviation of 1.28, the computed p-value is less than 0.001 which is describe as Very High Significant;

The significant effect of the innovated device to the student's performance in all of the competencies are Very High Significant. Therefore it is proven that the electrical technology devices can improved the performance of the students. This implied that the students learned more in using the Low Voltage Electrical Simulation Utility Model that the traditional wiring board due to the increase of self-confidence and motivation because of its multi-function that can perform the competency 1 to competency 5 in safest way.

RECOMMENDATION

Electrical instructors and professors should receive training and familiarization with the BOWIS device to effectively use it as an instructional tool. Workshops, seminars, or tutorials should be organized to ensure that instructors are proficient in utilizing the device.

Continuously develop and expand the BOWIS device's capabilities to cover a wider range of electrical circuit concepts. This will make it a versatile tool for instructors, catering to a variety of instructional needs.

Establish a regular maintenance schedule to keep the BOWIS device in optimal working condition. This will ensure its longevity and reliability in educational settings.

The administration may provide assistance for patenting of this developed device for IP protection and also to augment the scarcity of electronics technology instructional materials for effective instruction

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ENERGY HARVESTER OF FLOWING WATER USING PORTABLE GRAVITY GENERATOR DESIGN BY SINGLE PELTON WHEEL WITH MONITORING FOR STREET LIGHTING PURPOSES

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ABSTRACT

This project aims to create and test a novel energy harvester that uses a portable gravity generator powered by a single Pelton wheel to capture the kinetic energy of flowing water for the purpose to light up street to offer a dependable, cost-effective, and efficient alternative to conventional energy sources, particularly for remote and off-grid areas. A comprehensive literature review and development of two distinct designs are conceived which each concept was developed into a functional prototype, the chain-type and direct-type portable gravity generator powered by the Pelton wheel. The average velocity of water in the irrigation was measured to analyze the expected energy to be harnessed by the system. The two designs were implemented and compared using t-test analysis. The computed t-test value is 0.1152, more significant than the 0.01 level. This proves there is no significant difference between chain-type and direct-type portable gravity generators powered by Pelton wheels in terms of the produced power. This study is a practical solution for environmentally friendly street lighting but also sets a benchmark for future advancements in renewable energy harvesting and emphasizes the potential of Pelton wheel-based systems to help create a more sustainable and eco-friendly future.

Keywords: Pelton Wheel Energy Harvester, Portable Gravity Generator, Renewable Street Lighting, Kinetic Energy Utilization, Sustainable Energy Solutions

INTRODUCTION

The search for sustainable energy solution has made the study of renewable energy sources incresingly important (Suki et al., n.d.). Mindanao specifically in Surigao del Norte are sorrounded with bodies of water such as river, lakes, sea, and irrigation. This energy such as the kinetic energy of flowing water offers a promising avenue, particularly in places where conventional power sources are either unreliable or unreachable (VanZwieten et al., 2015). In line with the global trend towards more environmentally friendly energy sources, this research aims to create a portable gravity generator that uses just one Pelton wheel (Lv et al., n.d.).

In the context of urban infrastructure, particularly street lighting, where there is a growing need for eco-friendly and energy-efficient solutions, adopting such technology is especially pertinent (Hussain et al., n.d.). The efficacy of the impulse water turbine, or Pelton wheel, in transforming the energy of flowing water into mechanical power has been acknowledged (OYEBODE et al., 2018). Nevertheless, much research hasn't been done on how portable and scalable it may be for urban use, especially for street lighting (Amstel et al., 2018). By creating a portable design that is simple to incorporate into already-existing urban structures, this research seeks to close this gap (Jia et al., 2019). One unique method that blends old hydro-mechanical ideas with contemporary energy requirements is employing a single Pelton wheel in a gravity generator configuration (Singh, 2009). Despite recent developments in this field, the cost-effective and efficient use of renewable energy technology for urban street lighting is still a substantial gap (Ahmed et al., n.d.).

This study aims to design, construct, and assess a portable gravity generator system that illuminates urban streets by harnessing the kinetic energy of flowing water using a Pelton wheel. In addition to offering a substitute energy source, this research hopes to lessen carbon emissions and the need for fossil fuels. The phases of the research process include the initial conception and design of the gravity generator and the building and testing of prototypes. The design is optimized for optimal energy efficiency and adaptation to various metropolitan contexts. Integrating a thorough monitoring system is necessary to evaluate the system's energy output and performance in real-time. The approach combines theoretical and practical elements, guaranteeing a comprehensive assessment of the system's effectiveness in realistic scenarios.

STATEMENT OF THE PROBLEM

The study's general objective is to develop an energy harvester of flowing water using a portable gravity generator using a single Pelton wheel with monitoring for street lighting purposes.

Specifically, this study aims to answer the following.

1. What is the average velocity of water in the irrigation?
2. How much power was generated per hour during the first design of the system (Chain-Type)?
3. How much power is generated per hour in the second design of the system (Direct-Type)?
4. Is there significant difference between the two designs with respect to the generated power?

Hypothesis:

There is no significant difference between design one and design two in power-generated output.

METHODOLOGY

This research employs a conceptual framework, project setting, project development and data analysis for the energy harvester of flowing water using a portable gravity generator designed by a single Pelton wheel with monitoring for street lighting purposes.

Flow of the Project

The approach uses a waterfall framework to design and optimize a portable gravity generator equipped with a single Pelton wheel to harness energy from flowing water for street lighting. This methodological approach is subdivided into several key phases: design and conceptualization, simulation, prototype development, testing and data collection, monitoring system development, and integration with street lighting.

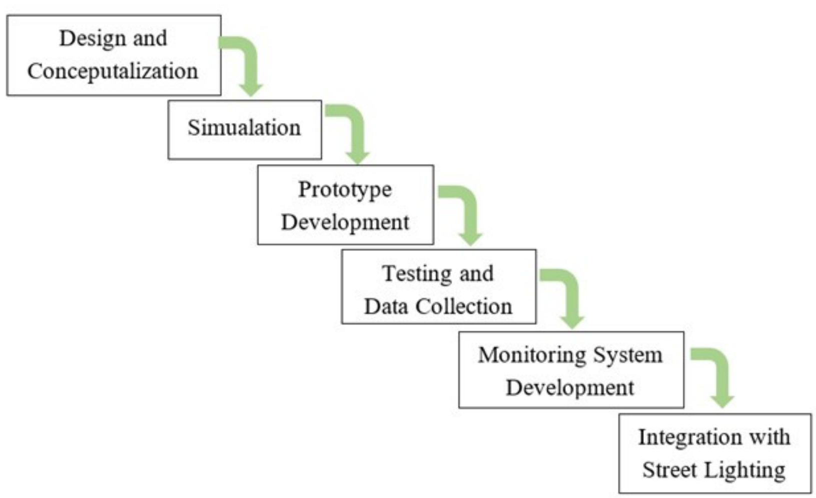

Figure 1. Flow of the Project

Existing literature on Pelton wheel designs, gravity generators, and energy harvesting are reviewed during the design and conceptualization phase. This review helps understand the current state of street lighting systems and the potential of renewable energy sources. Factors such as efficiency, portability, ease of maintenance, and environmental impact are considered in this phase. Following this, the project uses simulation software to model the energy harvester and optimize the design for maximum energy efficiency and output. A prototype is then constructed based on this optimized design.

The prototype's effectiveness in harnessing energy from flowing water is tested in both controlled and real-world environments, and data on energy output, efficiency, and reliability are collected. Concurrently, a monitoring system is developed to track the performance of the energy harvester. This system's GUI collects data on voltage and current generated relative to the water flow. Finally, the system is integrated with street lighting to test its efficiency and reliability in a practical application. This comprehensive methodology ensures a thorough evaluation and optimization of the portable gravity generator design for practical use in street lighting.

Project Setting and Implementation

The infrastructure is the first thing to consider when implementing this project study. The characteristics of the production environment must be accounted for. This strategy includes a review of hardware, software, communications, etc. The second is installing the production solution. This is the piece everyone remembers. The answer needs to be moved from development to test. The third is converting the data. Changing data from one format to another must occur once the infrastructure and the solution are implemented. Fourth is Performing the final verification in production. The last is monitoring the solution. Usually, the project team will spend some period monitoring the implemented solution. If problems arise immediately after implementation, the project team is responsible for fixing them.

Figure 2. Google Satellite of the Location

Implementing this project may be done as a series of short sprints that regularly deliver deployable work because it may be viewed as a project stage the spans months or years. Figure 2 shows the configuration of the area analyzed and implemented the prototype hydropower plant located at Barangay Nabago, Surigao City, Surigao del Norte.

Project Development

This study is experimental and creative. The researcher will collect this data using a combination of intelligence gathering from various sources, mainly from the internet, and the data results from experiments and the data produced by the developed model. The data results will be computed and statistically significant by determining the likelihood of the findings, resolving the potential output data, or calculating the electrical energy produced by the water flow and Pelton wheel gravity generator energy generation systems.

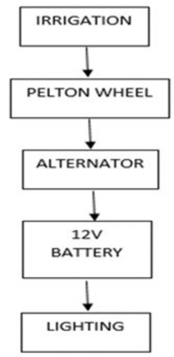

Figure 3. Project Development

As shown in Figure 3, the irrigation produces the Flow of water, which will drive the Pelton wheel directly to the alternator/generator and connect to the battery. Then, it will be distributed in the street lighting.

Data Analysis

The data gathered in the monitoring are analyzed and interpreted. The velocity of the water, voltage, current, and power were tabulated by the system. Weighted mean would be used for the analysis of computed and expected total energy and a T-test would be used for the test of significance of the generated power between the two designs.

RESULTS AND DISCUSSIONS

This section presents the following results in the monitoring data logging, simulation, fabrication of the system, specification, recorded flow of water, generated power and actual testing of the study.

Monitoring and Data Logging

The researcher used a microcontroller and a GUI to record the data of flow rate, velocity, and generated power, as shown in Figure 4 and Figure 5

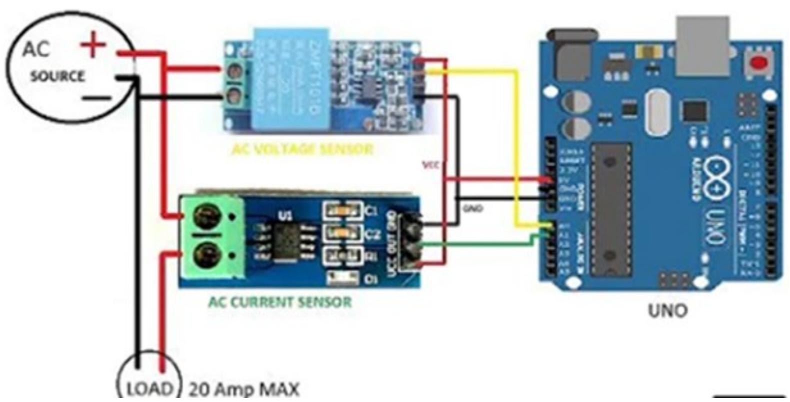

Figure 4. Microcontroller Control Circuit

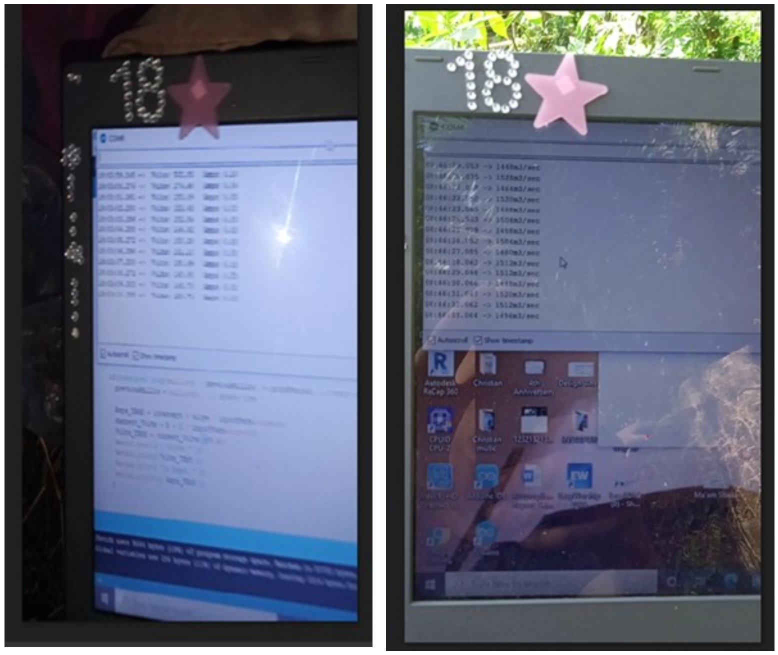

Figure 5. Graphical User Interface of Data Logging

Figures 4 and 5 are the microcontroller control circuit, the graphical user interface (GUI) for data logging, and the data collected on flow rate, velocity, and generated power. Implementing a microcontroller for real-time data monitoring and a GUI for user-friendly interaction demonstrates an efficient approach to tracking system performance. The collected data is crucial for evaluating the energy harvester's effectiveness and making necessary adjustments to optimize its performance.

Simulation

The development of an energy harvester of flowing water using a portable gravity generator designed by a single Pelton wheel with monitoring for street lighting purposes was simulated using the Solidworks Software, as shown in Figure 6.

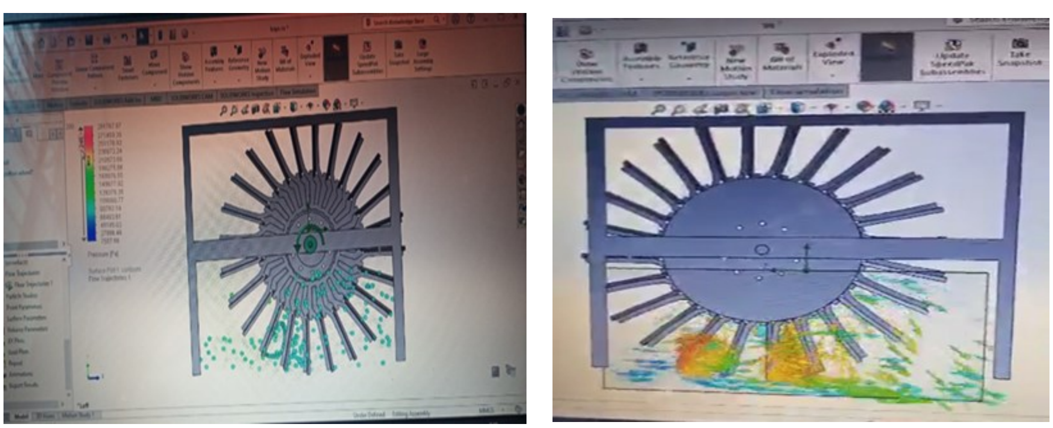

Figure 6. Simulation

Figure 6 shows the energy harvester design simulation results conducted using Solidworks software. This simulation is vital for predicting the system's behavior under various operating conditions and identifying potential improvement areas before actual fabrication and testing. It helps understand how different design aspects contribute to overall efficiency and functionality.

Fabrication of the System

The researcher made two types of Pelton wheels: the chain-type Pelton wheel, as depicted in Figure 7, and the direct-type Pelton wheel, as shown in Figure 8.

Figure 7. Chain Type Pelton Wheel Energy Harvester

Figure 8. Direct Type Pelton Wheel Energy Harvester

Figures 7 and 8 show the chain and direct-type Pelton wheel energy harvesters. The comparison between these two types of fabrications would provide insights into the practical aspects of design choices and their impact on the system's efficiency. It also highlights the adaptability of the Pelton wheel design to different mechanical configurations.

Specifications

Table 1 shows the specification of the bill of materials and cost. The materials were locally available, and some were fabricated due to unavailability.

Table 1. Bill of Materials

Components	Cost
Battery	2500
Light Bulbs 5 watts	500
Wire	400
Angle Bar	750
Pulley	300
Bolts and Nuts	300
Chain	150
Bearings	240
Sprocket	200
Micro DC Generator	1000
Labor	1,500
Transportation	500
Components	1,200
Sub-total	9,240
Work-up	1,760
Grand Total	**11,000**

Table 1 details the components and associated costs of building the portable gravity generator. It lists items like sprockets, micro-DC generators, labor, and transportation, providing a clear overview of the financial investment required for the project. This table is crucial for understanding the economic feasibility of the system. It sets the foundation for assessing the cost-effectiveness of the design.

Recorded Flow of Water

The flow of water in the site was recorded hourly with the flow sensor in cubic meters per hour. Table 2 shows that the average volume of water is 1,391.36 m3/hour. The graph shows a consistent amount of flow over time.

Table 2. Velocity of Water per Hour

Time (per hour)	Average Flow in f^3/hr
15:00:03	1488
16:00:10	1472
17:00:16	1464
18:00:23	1552
19:00:29	1560
20:00:36	1552
21:00:42	1512
22:00:56	1440
23:00:02	1432
24:00:08	1512
01:00:15	1536
02:00:21	1528
03:00:27	1520
04:00:34	1488
05:00:40	1488
06:00:47	1552
07:00:53	1560
08:00:00	1520
09:00:06	1456
10:00:13	1472
11:00:19	1552
12:00:26	1560
13:00:32	1504
14:00:39	1523
15:00:03	1543

Table 2 presents data on the recorded Flow of water at the site, measured hourly using a flow sensor. It shows the average Flow of water in cubic feet per hour is 1511.44 f3/hr, with a minimum of 1432 f3/hr and a maximum of 1560 f3/hr, indicating a consistent flow rate over the monitored period. This data is vital for understanding the site's water dynamics and suitability for energy harvesting using the Pelton wheel.

Generated Power

This section presents the 1 day in hourly data logging of the developed energy harvester of flowing water using a portable gravity generator designed by a single Pelton wheel with monitoring for street lighting purposes.

Table 3. Generated Power per Hourly Basis of Chain Type Pelton Wheel Energy Harvester

Time (Per Hour)	Voltage (Volts)	Current (Ampere)	Power (Watts)
14:33:00	165.95	0.03	4.9785
14:33:03	158.26	0.03	4.7478
16:33:10	164.43	0.03	4.9329
17:33:16	164.21	0.03	4.9263
18:33:23	165.79	0.03	4.9737
19:33:29	162.35	0.03	4.8705
20:33:36	158.43	0.03	4.7529
21:33:56	159.56	0.03	4.7868
22:33:56	162.69	0.03	4.8807
23:33:02	162.7	0.02	3.254
24:33:08	159.43	0.03	4.7829
1:33:15	132.93	0.03	3.9879
2:33:21	159.4	0.03	4.782
3:33:23	137.36	0.03	4.1208
4:33:23	164.05	0.03	4.9215
5:33:10	168.38	0.03	5.0514
6:33:56	164.99	0.03	4.9497
7:33:23	166.06	0.03	4.9818
8:33:22	159.5	0.03	4.785
9:33:12	159.4	0.03	4.782
10:33:52	166.34	0.03	4.9902
11:33:43	167.54	0.03	5.0262
12:33:44	169.124	0.03	5.07372
13:33:28	170.1	0.03	5.103
14:33:32	171.35	0.04	6.854

Table 3 provides detailed measurements of the power generated hourly by the chain-type Pelton wheel energy harvester. It includes time, voltage, current, and total power output. The table is essential for evaluating the performance and efficiency of the chain-type design in converting water flow into electrical energy.

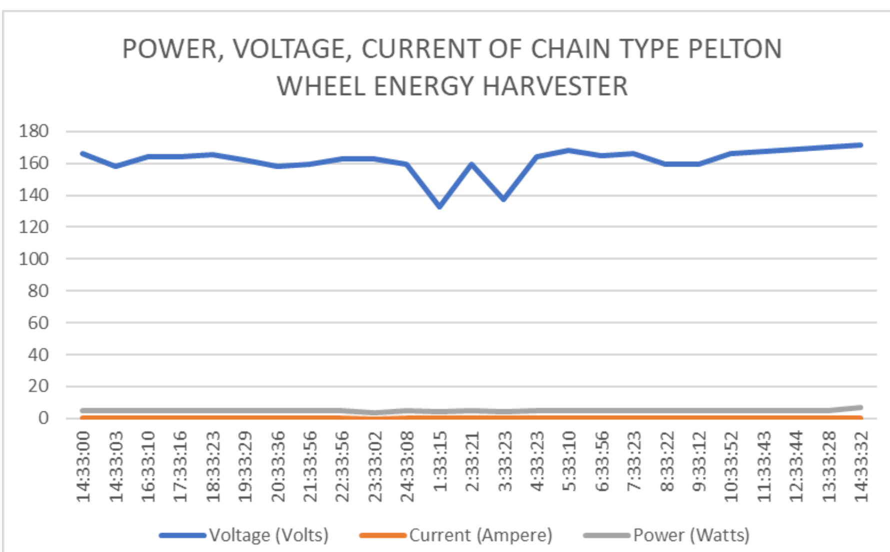

Figure 9. Generated Power, Voltage, and Current of Chain Type Pelton Wheel Energy Harvester

Table 4. Generated Power per Hourly Basis of Direct Type Pelton Wheel Energy Harvester

Time (Per Hour)	Voltage (Volts)	Current (Ampere)	Power (Watts)
14:33:00	157.95	0.03	4.7385
14:33:03	171.26	0.03	5.1378
16:33:10	170.43	0.03	5.1129
17:33:16	171.21	0.03	5.1363
18:33:23	172.79	0.03	5.1837
19:33:29	171.35	0.03	5.1405
20:33:36	169.43	0.03	5.0829
21:33:56	168.56	0.03	5.0568
22:33:56	171.69	0.03	5.1507
23:33:02	170.7	0.02	3.414
24:33:08	169.01	0.03	5.0703
1:33:15	152.93	0.03	4.5879
2:33:21	172.4	0.03	5.172
3:33:23	169.36	0.03	5.0808
4:33:23	171.05	0.03	5.1315
5:33:10	172.38	0.03	5.1714
6:33:56	171.99	0.03	5.1597
7:33:23	173.06	0.03	5.1918
8:33:22	174.5	0.03	5.235
9:33:12	169.4	0.03	5.082
10:33:52	178.34	0.03	5.3502
11:33:43	169.57	0.03	5.0871
12:33:44	169.12	0.03	5.0736
13:33:28	171.1	0.03	5.133
14:33:32	173.35	0.04	6.934

Table 4 outlines the hourly power generation data for the direct-type Pelton wheel energy harvester. Like Table 3, it includes critical parameters like time, voltage, current, and total power output, offering a comprehensive view of the direct type design's energy generation capabilities. This data is instrumental in comparing the direct type design with the chain type, assessing their respective efficiencies and practicalities.

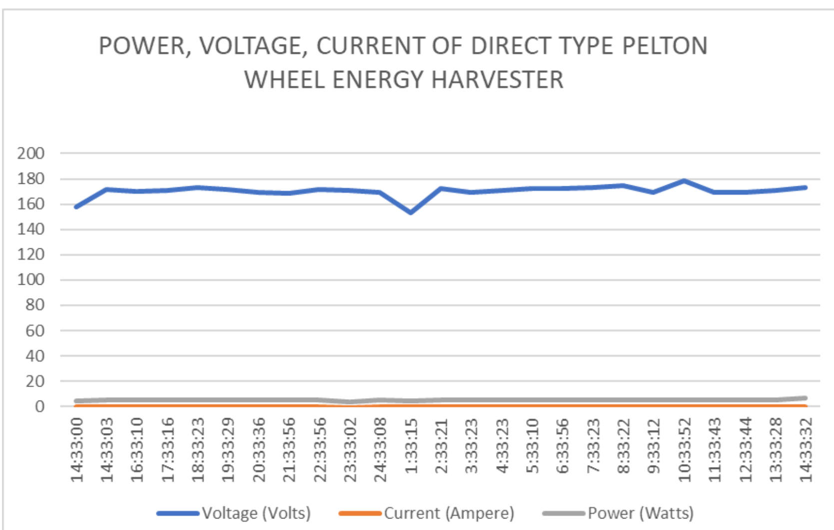

Figure 10. Generated Power, Voltage, and Current of Chain Type Pelton Wheel Energy Harvester

Figures 9 and 10 present the data on power generated by the chain and direct-type Pelton wheel energy harvesters. The data would be crucial for assessing the energy output efficiency of each design. The comparison of these two designs in terms of power generation would provide a clear understanding of which method is more efficient or if they are equally effective.

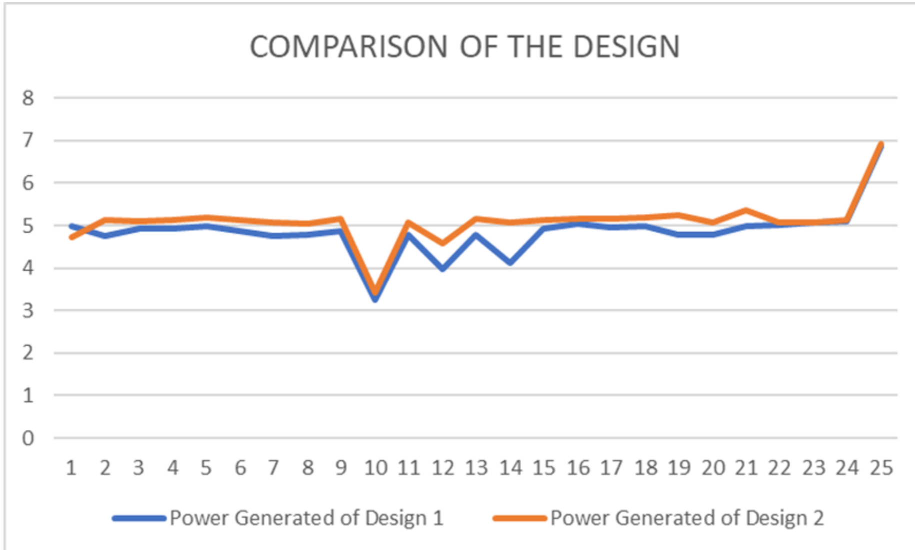

Figure 10. Comparison of Design 1 and Design 2

When comparing the outcomes of two designs using the T-test analysis statistics, the generated t-test value is 0.1152, which is more significant than the 0.01 level. This proves that there is no discernible difference between designs 1 and 2 in terms of the produced output. A direct comparison of the generated power for the two configurations is shown in Figure 10. The t-test analysis suggests no significant difference in performance between the two designs; this comparison is necessary to validate that theory. It makes it possible to objectively evaluate the designs, which helps clarify their potential scalability and valuable applications.

Actual Testing

This section presents the installation and actual generation of the developed energy harvester of flowing water using a portable gravity generator designed by a single Pelton wheel with monitoring for street lighting purposes.

Figure 11. Two Bulb Generated Power and Constructed Street Lighting Post

Figure 11 illustrates the real-world implementation, including the installation procedure and the system's real-generation capabilities. It is an essential part of the study since it shows how the energy harvester may be used in a real-world setting and offers factual proof for the conclusions drawn from simulations and theories that were previously provided.

CONCLUSION

In summary, there is no significant difference between Design 1 and Design 2 in terms of the created output, according to the T-test analysis results, which have a value of 0.1152, higher than the 0.01 significance level. This is a significant finding since it implies that the two portable gravity generator designs using a single Pelton wheel are equally capable of capturing the energy of flowing water to light up streets. Thus, the research offers a workable approach to sustainable energy harvesting. It illustrates the usefulness and effectiveness of implementing such systems in actual settings, especially for improving urban street lighting utilizing renewable energy.

These results further highlight the technology's scalability and broader application potential. The designs' successful installation and testing offer a strong platform for upcoming advancements in renewable energy gathering, mainly when off-grid solutions are necessary. This study contributes to a more energy-efficient and ecologically sensitive future by addressing the pressing demand for sustainable urban street lighting and creating new opportunities for research and development in the field of renewable energy.

RECOMMENDATIONS

1. Further Research and Development: Future studies should focus on enhancing the efficiency and durability of the Pelton wheel design under varying environmental conditions. Research could explore materials and coatings that improve the longevity and performance of the wheel, especially in diverse water quality scenarios.

2. Scalability and Adaptation: Investigate the scalability of the portable gravity generator for different applications beyond street lighting, such as powering small communities or as an emergency power source. Adaptability to different water flow rates and volumes should also be explored to widen the application range.

3. Integration with Smart City Infrastructure: There is potential for integrating this technology with smart city infrastructure. Future research could focus on developing smart monitoring systems that optimize energy use based on real-time data, contributing to more efficient urban energy management.

4. Environmental Impact Assessment: Conduct a thorough environmental impact assessment to ensure that the deployment of these systems does not adversely affect local ecosystems, particularly aquatic life. This includes assessing the potential impacts of installation, operation, and maintenance activities associated with the gravity generators.

5. Economic Analysis and Commercial Viability: An in-depth economic analysis is recommended to evaluate the commercial viability of this technology. This should include cost-benefit analyses considering the installation, maintenance, and operational costs compared to traditional street lighting systems.

6. Community Engagement and Education: Initiatives to educate local communities and stakeholders about the benefits and operation of the Pelton wheel-based energy harvester are vital. This includes developing outreach programs that raise awareness about renewable energy and its impact on reducing carbon footprints.

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RESEARCH COMPETENCIES OF TEACHERS: BASIS FOR A CAPABILITY BUILDING PROGRAM DEVELOPMENT

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ABSTRACT

One of the most essential abilities for teachers is the capacity to produce research. Finding a solution to problems through research requires considerable expertise. There is a need for expertise in research-based teaching, which necessitates the development of certain skills and competencies to build self-assurance and teaching competence. This study aimed to reveal the research competencies of teachers in terms of conceptualizing research problems, conceptualizing design, and competence in writing research per se. This makes use of the descriptive survey method to obtain information from the full-time teachers. Results revealed that generally, the respondents had the competencies in most of the indicators, however, they need to be guided on determining and treating data using statistics and on formulating hypothesis and writing abstract. The findings implied that research is a familiar activity to the respondents, however, lack of time, difficulty in looking for access sources on the review of literature and studies and on gathering, analysis and interpretation of data were a challenged to produce research. A proposed capability building program will aid the respondents to improve and enhance their research competencies.

Keywords: research competencies, challenges on research writing, capability building program

INTRODUCTION

The advancement of scientific and technical knowledge depends on research. It is the starting point for the development of conceptual understanding and practical competence in any discipline. Research by its nature provides opportunities for innovation that develop higher cognitive capabilities and foster creativity. The Commission on Higher Education in the Philippines reaffirmed the fact that the primary role of Colleges and Universities in the country is to generate and disseminate knowledge. Therefore, research is an academic activity by education professionals who continuously advocate learning, finding out new things, analyzing information, adapting behavior and improving modern demands on educative standards and quality teaching. The work of the faculty in the higher education institutions has traditionally been trifocal, consisting of teaching, research and community extension. Educational professionals like the teachers and staff are required to become instructors, researchers and service-oriented professionals. The challenge is in maintaining the three tasks in sustaining one's academic career especially on the part of research.

Teachers are both research producers and research consumers. They engage in research by reading related materials in pursuit of empirical knowledge. These refer to online articles, as well as local and foreign research journals. They read to stay updated with professional information, gather more references for their teaching, and learn about new methods and techniques. Teachers do value attending research conferences to exchange ideas and practices with colleagues and learn from the experts. In that sense they continue to implement what they learn on research in their teaching practices.

The ability to conduct research is among the most crucial skills for teachers. Finding a solution to problems through research requires considerable expertise. There is a need for expertise in research-based teaching; requiring specific skills and competencies to attain confidence and capability in teaching research-based subjects (Salde, K., 2021).

The study by Ulvik and Smith (2019) revealed that personal and contextual factors influence teachers' research engagement. From personal, the impact and significance of teachers' conceptions and attitudes toward research involvement is that there is a link between their research ability and their role as a researcher. When they highly value research, most likely they will do a research related tasks like attending workshops, apply research knowledge in practice and carrying out their own research. On contextual factors, if the system of the school demand for research output, these can be a driving force for their research engagement. Active support from institutional leaders, time allotted by the organization, financial support and strong need for the organization to participate in research engagement can result from research output from teachers as well.

A variety of abilities were required for doing research. For the teacher professional development, coaching and research skill development methodologies were used to advance teacher competency. Teachers should be trained by the specific subject matter experts, instructional specialists, group and dyadic discussions, teacher reflection, and practical experiences through Wdolkowski's motivational approach as a technique to improve their research skills (Collet, 2015). A review of related studies on research skills of developing researchers has revealed some major research skills that are important such as information seeking skills, writing skills, methodological skills, and data analytical skills (Willison & O'Regan, 2007).

Research by its nature provides opportunities for innovation that develop higher cognitive capabilities and foster creativity. The work of faculty in the higher education institutions has traditionally been trifocal, consisting of teaching, research and community extension. The change is in maintaining the three tasks in sustaining one's academic career especially on the part of research.

STATEMENT OF THE PROBLEM

With the purpose of revealing the research competencies of teachers in National College of Business and Arts, the following research questions were addressed:

1. What is the profile of the respondents based on:
    1.1 Age;
    1.2 Sex;
    1.3 Civil Status;
    1.4 Years in Service;
    1.5 Highest Educational Attainment; and
    1.6 Field of Specialization?
2. How do the respondents assess their research competencies in terms of:
    2.1. Conceptualizing research problem;
    2.2. Conceptualizing research design; and
    2.3. Competence in writing?
3. Is there a significant difference between the respondents' research competencies when group according to the profile variable?
4. What are the major challenges encountered by the respondents in research writing?
5. Based on the findings, what capability-building program can be proposed to develop and enhance the research competencies of the respondents?

METHODOLOGY

This study makes use of the descriptive survey method to obtain information needed in determining the research competencies of teachers. The survey was devised based upon the indicators formulated by the researcher. Questionnaires were also utilized to gather relevant and pertinent data and information to answer the questions of the study. The respondents were the teachers of National College of Business and Arts (NCBA), Quezon City. The researcher involved sixty (60) respondents from ninety-six (96) full-time faculty, drawn using the random sampling method.

The construction of the research made instrument was based on the following indicators to wit:

1. Conceptualizing research problem
2. Conceptualizing research design
3. Competence in writing
4. Major challenges in writing research

The researcher formulated the 18 statements. Each item used a four-point Likert scale:
4 – Highly Capable
3 – Capable
2 – Less Capable
1 – Not Capable

The questionnaire is validated by a research expert before distribution. The researcher-made instrument drew some of the questions from the related literatures and studies resulting in validated questions. After questions were gathered, they were sorted, tabulated and treated in the following manner. Mean scores were computed to describe the research competencies of the reports.

FINDINGS

The involvement of teachers in research is very significant in carrying out policies and capability program of the College. Research also serves as a pedagogical tool and guide to the development of teaching and learning activities. Here are the results and findings of the study.

I. Respondents' Profile

Table 1. Age Distribution of the Respondents

Age	Frequency	Percentage
21 – 30 years	24	40
31 – 40 years	12	20
41 – 50 years	13	22
51 years and above	11	18
Total	**60**	**100%**

Mean Age = 37.33 years   Standard Deviation = 11.57   Variation Coefficient = 31%

Presented in Table 1 is the profile the 60 employee-respondents according to age. The 24 respondents, or 40%, who were 21 to 30 years old during the survey comprised the highest number. They were followed by the 13, or 22%, who were then aged 41 to 50, and by the 31 to 40 years old who comprised 20% of the respondent group. The oldest group, 11 employees aged 51 years old and above, had the smallest number as they comprised only 18%.

The mean age of the respondents was 37.33 years and the standard deviation-derived coefficient of variation reveals a dispersion of 31% among their ages.

Table 2. Profile of the Respondents According to Sex

Sex	Frequency	Percentage
Male	28	47
Female	32	53
Total	**60**	**100%**

As indicated in f = 32 or 53% presented in Table 2, majority of the respondents were females. It may, however, be noted that they just slightly outnumbered the 28 male employees who comprised 47% of the study participants.

Table 3. Distribution of the Respondents According to Civil Status

Civil Status	Frequency	Percentage
Single	29	48
Married	30	50
Others	1	2
Total	**60**	**100%**

Table 3 reports that the 30 married employees, or 50%, just slightly outnumbered the 29 single ones who made up 48%. The substantial number of the unmarried employees may be due to the biggest number of study participants being just in their twenties, as reported in Table 1.

Table 4. Respondents' Years in Service

Years in Service	Frequency	Percentage
0 – 5	42	70
6 – 10	6	10
11 – 15	4	7
16 – 20	2	3
21 and above	6	10
Total	**60**	**100%**

Mean Age = 6.32 years   Standard Deviation = 6.83   Variation Coefficient = 108%

As can be gleaned from the Table 4 data, majority of the employee-respondents, or over two-thirds, have only been employed in the College for five years and below. This is substantiated in f = 42 or 70%. The highest number of the respondents being just in their twenties, as reported in a foregoing data, may explain this. Distantly following them are two groups of respondents, those who have been in service for 6 to 10 years and for 21 years and above, who each numbered 6 or 10%.

It is likewise noteworthy that the data's standard deviation of 6.83 exceeded the mean, which is 6.32 years, resulting in a variation coefficient of 108%. This indicates a very wide distribution of the employees' lengths of service, as manifested in the table.

Table 5. Highest Educational Attainment

Educational Attainment	Frequency	Percentage
Bachelor's Degree	15	25
Master's Degree	35	59
Doctorate Degree	10	16
Total	**60**	**100%**

As substantiated in the Table 5, reported frequency of 35, or 59%, majority of respondents are Master's Degree holders. Distantly following them are the 15, or 25%, whose highest educational attainment is a Bachelor's Degree and the 10 respondents, or 16%, with doctorates.

It may be inferred from the data that the respondents prioritize continuing education in their careers, with 75% of them obtaining post-baccalaureate degrees.

II. Research Competencies of the Respondents

Table 6. Conceptualizing Research Problems

Competencies	Mean	Verbal Interpretation
Formulating research title/concept	3.20	Capable
Writing theoretical and conceptual framework	3.07	Capable
Writing statement of the problem	3.20	Capable
Formulating hypotheses	3.02	Capable
Writing definition of terms	3.32	Highly Capable
Writing significance of the study	3.22	Capable
Reviewing and synthesizing literature and studies	3.07	Capable
Composite Mean	**3.16**	**Capable**

Table 6 results showed that the respondents are highly capable in writing of definition of terms with the mean of 3.32, followed by writing significance of the study with 3.22. Although the rest of the indicators are still interpreted as capable, respondents revealed that formulating hypotheses got lowest among the indicators mean of 3.02.

One of the goals of the researchers is to generalize the findings beyond the specific conditions which they were obtained. A hypothesis is a specific, testable predictions about what you expect to happen in the study. To complete the hypothesis, it must include the components – the variables, the population, and the difference/ relationship between the variables (Deocampo, R., n.d.).

Table 7. Conceptualizing Research Design

Competencies	Mean	Verbal Interpretation
Determining research design to apply in the study	3.02	Capable
Selecting appropriate techniques for data collection	3.25	Capable
Selecting appropriate sampling	3.00	Capable
Constructing research instrument/questionnaire	3.00	Capable
Determining and treating statistics	2.73	Capable
Composite Mean	**3.00**	**Capable**

Table 7 presented that respondents are capable of conceptualizing research design with the composite mean of 3.0. At the average, the respondents are capable of selecting appropriate techniques for data collection with 3.25 followed by constructing research instrument/ questionnaire and selecting appropriate sample with a rating of 3.00). The lowest mean of 2.73 is in determining and treating statistics.

According to Obilor, E. (2022), to ensure the appropriate use of statistics, the study recommended that the application of data should be timely, responsibly, ethically, and visually done for whatever purpose it used for. Statistics entails the collection, description, analysis and interpretation of data and inferences of conclusions from the analyzed data.

Table 8. Competence in Writing

Competencies	Mean	Verbal Interpretation
Writing abstract	3.03	Capable
Writing bibliography	3.08	Capable
Applying APA format	3.03	Capable
Writing conclusions and recommendations	3.20	Capable
Writing introduction and background of the study	3.25	Capable
Composite Mean	**3.11**	**Capable**

Table 8, got an overall mean of 3.11 in competence in writing research which is capable. Based on the indicators, respondents are capable of writing introduction/ background of the study with a highest mean score of 3.25, followed by writing conclusions and recommendations with 3.20. Moreover, writing abstract and applying APA format got the lowest mean of 3.03. It only proves that the respondents need to review on how to apply the APA format and write abstract.

Based on the article of Simkhada, P. (2013), an abstract is a succinct summary of a longer pieces of work, which is published in isolation from the main text and should therefore stand on its own and be understandable without reference to a longer piece.

III. Significant Difference of the Competencies When Group According to Profile

Table 9. Difference in the Research Competencies of the Respondents When They are Grouped According to Age

Competencies	Computed Kruskal Wallis H	Tabular Value (X^2)	Interpretation	H0 Decision
Conceptualizing Research Problems	0.52	7.82	Not Significant	Accept
Conceptualizing Research Design	0.35	7.82	Not Significant	Accept
Competence in Writing	0.42	7.82	Not Significant	Accept
Degrees of Freedom = 3.0			Level of Significance = 0.05	

Results of test of difference in Table 9 reveal an absence of disparity in the research competencies of the respondents across the three areas when they are grouped according to age. Leading statistical support to this are the computed H-values of 0.52, 0.35, and 0.42 for Conceptualizing Research Problems, Conceptualizing Research Design and Competence in Writing respectively, which all fell below the tabular value of 7.82 at 3 degrees of freedom and 0.05 level of significance.

It may be inferred from this that age is not a factor to developing research competencies, and that one may acquire the latter regardless of how young or old he/she is.

Table 10. Difference in the Research Competencies between the Male and Female Employees

Competencies	Mean		SD		t-Value		Interpretation / H0 Decision
	M	F	M	F	Comp	Tab	
Conceptualizing Research Problems	3.06	3.32	0.55	0.57	1.80	2.0	Not Significant / Accept
Conceptualizing Research Design	2.93	3.11	0.53	0.61	1.22	2.0	Not Significant / Accept
Competence in Writing	2.99	3.20	0.60	0.68	1.27	2.0	Not Significant / Accept

Degrees of Freedom = 58 Level of Significance = 0.05

M: Males; F: Females *SD: Standard Deviation* *Comp: Computed* *Tab: Tabular*

Although a perusal of Table 10 shows that the female respondents consistently outrated their male colleagues in all the areas of research competencies, the differences between the two groups' scores are not statistically significant. This may be inferred from the computed t-values of 1.80 for Conceptualizing Research Problems, 1.22 for Conceptualizing Research Design, and 1.27 for Competence in Writing, which were all less than the critical value of 2.0 at 58 degrees of freedom and 5% alpha.

Table 11. Difference in the Technological Competencies in the Employees Grouped According to Civil Status

Competencies	Mean		SD		t-Value		Interpretation / H0 Decision
	Single	Married	Single	Married	Comp	Tab	
Conceptualizing Research Problems	3.12	3.2	0.58	0.56	0.47	2.0	Not Significant / Accept
Conceptualizing Research Design	2.97	3.04	0.53	0.61	0.47	2.0	Not Significant / Accept
Competence in Writing	3.07	3.08	0.62	0.67	0.06	2.0	Not Significant / Accept

Degrees of Freedom = 57 Level of Significance = 0.05

One respondent's civil status was not identified. *SD: Standard Deviation* *Comp: Computed* *Tab: Tabular*

The respondents' marital status is likewise an insignificant factor to their level of research competencies, as reported in Table 11. Substantiating this are the computed t-values of 0.47, 0.47, and 0.06 for Conceptualizing Research Problems, Conceptualizing Research Design and Competence in Writing respectively, which failed to satisfy the tabular value of 2.0 at 57 degrees of freedom and 0.05 significance level.

The single and younger employees' youth and less domestic concerns their married colleagues experience may not necessarily give them a greater advantage to conceptualized and produce a research.

Table 12. Difference in the Technological Competencies of the Respondents When They are Grouped According to Years in Service

Competency Area	Computed Kruskal Wallis H	Tabular Value (X^2)	Interpretation	H0 Decision
Conceptualizing Research Problems	1.80	7.82	Not Significant	Accept
Conceptualizing Research Design	0.57	7.82	Not Significant	Accept
Competence in Writing	0.16	7.82	Not Significant	Accept

Degrees of Freedom = 3.0 Level of Significance = 0.05

Outcomes of tests of difference posted in Table 12 indicate that years spent at work, which entail amount of time spent in the writing research, do not necessarily make a teacher more competent in research than his or her colleagues. Corroborating these are the computed Kruskal Wallis H values of 1.80 for Conceptualizing Research Problems, 0.57 for Conceptualizing Research Design, and 0.18 for Competence in Writing, which were all less than the tabular value of 7.82 at 3 degrees of freedom and 0.05 level of significance.

IV. Major Challenges Encountered by Respondents on Research Writing

Table 13. Major Challenges Encountered by the Respondents on Research Writing

Challenges Encountered	Frequency	Percentage
Time and interest in writing	30	50
Data gathering, analysis and interpretation	15	25
Looking for RRL and access to sources	22	37
Approval of consent	2	3
Formulating concept and statement of the problem	13	22
Formulating questionnaire	6	10
Not expense to other types of research methods	3	5
Statistics	5	8
Technology challenges and research skills	5	8
Financial constraints	3	5

Table 13 revealed that most of respondents encountered challenges in conducting research. Fifty percent (50%) of the respondents challenged by time and interest in writing, 37% had a difficulty in looking for access sources on the review of literature and studies and the additional burden on their part is on the data gathering, analysis and interpretation that got a 25% from the responses.

CONCLUSION

Generally, the respondents are capable in all the identified indicators. The findings implied that research is a familiar activity to the respondents. They are capable to produce a research but they need to be guided on determining and treating data using statistics and on formulating hypothesis and abstract. The profile of the respondents are insignificant to their level of research competencies. However, lack of time, difficulty in looking for access sources on the review of literature and studies on the data gathering, analysis and interpretation are the major challenges they encountered in producing a research.

RECOMMENDATIONS

In the light of the conclusion, the following recommendations are made.

1. Research can be a requirement for teachers in all ages, gender, civil status, years in service, and educational status. Research writing must also be a part of criteria for ranking and promotion.
2. Mentoring and action planning must be a means to improve the competencies of the teachers. There must be a statisticians who are experts in treating the data gathered. This can add to the motivation of the researcher to conduct research. Teachers must be provided with the proper training either in-service or attending conferences, in this way they can have the necessary techniques and be familiar on the use of language in academic writing and research.
3. The curriculum planner and school management should consider research as a part of the culture so that the teachers with their students will be transformed into research intensive learning and may create different ways of building and strengthening the teaching and learning research process. This may give the teacher a time and effort with a reasonable amount of resources to produce a research.
4. A capability building program will aid the respondents to develop and enhance their research competencies.

Proposed Research Capability Building Program

The core functions of higher education institutions (HEIs) is to advance, create, disseminate knowledge through research (Kataeva & DeYoung, 2018). RA 7722, which created the Philippine Commission on Higher Education (CHED) the internal quality assurance framework considers research as one key result area in assessing the quality of Philippine HEIs (CHED, 2017). The National Higher Education Research Agenda 2 explicitly states the principal function of Philippine HEIs to produce knowledge towards global competitiveness.

In line with this, National College of Business and Arts (NCBA) primary objective is to maintain a sustainable research culture that leads to the continuous improvement of competencies of the teaching and the non-teaching personnel. Therefore, this lead to the creation of a Research Capability Program for Teachers. The program aimed to promote a culture of research among faculty members, non-teaching personnel, students, and even administrators gearing towards the target of ensuring the continuity of research activities during uncertain conditions. The need to strengthen research capability has led the Research and Development Office to provide research-oriented training programs, including various coaching and mentoring and workshops, at the end of which, it is anticipated that the participants will be able to carry out research works. However, to do research needs more than just training, it also requires a research infrastructure, technical back-up, funds and other support.

GOALS AND OBJECTIVES	STRATEGIES AND ACTIVITIES	TIME FRAME	PERSONS INVOLVED	MATERIALS NEEDED	EXPECTED OUTPUT
To assess research needs from participants	Assess research technical skills and capabilities in conducting research	January – February	Research Director, Teachers, Non-Teaching Personnel	Assessment Tool	Validated Results
	Identify the following based on the assessment results: Strengths Weaknesses	March	Research Director		Categorized list
	Seek support from the Human Resource Department for the intervention/ capacity training/ workshop	April – May	Research Director Human Resource Director	Research Training Matrix	Quality Research Output
To promote research culture	Conduct In-Service Training -formulating hypotheses -treating data using statistics -gathering, analyzing and interpreting data -writing abstract	June- July	Research Director Human Resource Director Academic Heads	Research Training Courseware	Research Output Presentation
	Organize a coaching and mentoring to those who handle research courses and those who will conduct research to determine the following: Issues/ problems experienced Proper scheduling and submission Task reduction and for them to have time in conducting research Tips and references	Year-round	Research Director, Research Advisers, Researchers		Minutes of the group discussion
	Conduct assessment session	December & May		Evaluation Report	Accomplishment Report
To develop research skills and competencies	Encourage them to attend local and international seminars and conferences to enhance capabilities	Year-round	Research Directors, Teachers, Non-teaching personnel	Attendance Report	Certificate of Attendance
	Encourage them to be a member of research organizations	Year-round	Research Directors, Teachers, Non-teaching personnel	Membership Report	Certificate of Membership in Research Professional Organizations

Moreover, there are indicators of research culture evident in academic institution. They are productivity or how prolific the academics in producing researches in the field of their specialization, dissemination and how well they can share their research results to various platforms – association and conferences, media and publications and utilization or how immediate the results can be used to improve process, policy, curriculum, extension services and even training and development (Villena et al. 2018).

Other suggested enabling mechanisms include a well-established mentorship process, research immersion in research institutions or industry, and the presence of a stable information communication technology infrastructure or software that allows the researchers to check and verify the facts at their fingertips. Similar to this, there are sustaining factors that enable the research culture to develop and flourish. These include establishing partnerships and collaborations with professional associations, revisiting the process of evaluating faculty requirements during the recruitment process to build a critical mass of faculty researchers, and hiring personnel with research skills as well as the proper attitude and orientation toward research. The development of knowledgeable academics and staff, as well as the proper encouragement to keep them engaged in research, are among the achievements of research culture in the College.

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MARKETING MIX STRATEGIES OF SELECTED LOCAL FOOD RETAILERS AND SERVICE PROVIDERS IN THE FOURTH CONGRESSIONAL DISTRICT OF QUEZON

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ABSTRACT

The study aimed to determine the effectiveness of marketing mix strategies implemented by the local food retailers and service providers and their problems encountered in implementing these strategies. Quantitative descriptive correlational design and traditional and online validated questionnaire were utilized to collect data from 235 total respondents. The findings revealed that most respondents were from Lopez, Quezon, owned food and beverage retail stores by sole proprietors with 1–5 employees, and had been in business for 1–3 years, earning P9,000 in gross monthly income. The respondent's perception of product strategy was very effective; place and pricing strategies were as effective; and the promotional strategy was moderately effective. Strong competition, having a small store to carry diverse products, an insufficient budget for promotional activities, the price sensitivity of customers, and an increase in operating expenses were all problems encountered when implementing the marketing mix strategies. Moreover, there was a significant difference in place strategy regarding the number of employees and geographical location. There were also significant differences in promotional strategies when grouped according to years of operation, type of food business, number of employees, and form of ownership. In terms of price strategies, it also revealed a significant difference when grouped according to geographical location. The researcher recommended identifying the unique selling proposition to be competitive, taking advantage of available social media opportunities, improving product costing, and continuing to innovate their marketing mix strategies by considering the proposed recommendation.

Keywords: local food retailers, service providers, marketing mix strategies

INTRODUCTION

Marketing mix strategies are methods used by firms for effective marketing that combines product, pricing, promotion, and place. Creating and delivering unique value to prospective customers and acquiring a competitive advantage is the primary importance of marketing. To remain competitive, any business industry must have proper execution and development of marketing mix strategies.

Quezon Province, in the Calabarzon Region, is a place of peace and order that attracts industries and investments. According to the Business Permit and Licensing Office of the different municipalities in the Fourth District of Quezon as of 2022, there are a total of six hundred eight (608) registered local food retailers and food service providers from ten municipalities. These municipalities include Alabat, Atimonan, Calauag, Guinayangan, Gumaca, Lopez, Perez, Quezon, Tagkawayan, and Plaridel.

Filipinos love food, as seen by the delicacies offered during town fiestas and the numerous restaurants, food chains, food stalls, and other dining establishments located across the city and province. Based on the preliminary results of the 2020 Annual Survey of Philippine Business and Industry (ASPBI), shows that a total of 29,384 establishments in the formal sector of the economy were engaged in accommodation and food service activities. Restaurants and mobile food service activities accounted for most of the establishments, with 22,366 or 76.1 percent of the total number of establishments. This was followed by short-term accommodation activities with 3,870 establishments (13.2%) and beverageserving activities with 2,095 establishments (7.1%). The National Capital Region (NCR) has 9,893 establishments, or 33.7 percent in total. Calabarzon ranked second with 4,227 establishments (14.4%).

Local food retailers and service providers include food sold to consumers for preparation and consumption at home as well as the final preparation of food for consumption away from home. Restaurants, cafeterias, carinderias, food stalls, and food carts are common examples of enterprises that prepare the final product and offer it ready to eat. According to Rampal (2018), having good food eventually results in satisfied customers' profitable business. Food will always be the priority product of local food retailers and service providers and can never be replaced. Marketing mix strategies are one of the factors that influence a customer's decision to buy products or services.

As stated by Owomoyela, Oyeniy, and Ola (2013), marketing mix is a strategy that organizations use to provide their target customers with quality products at an affordable price, offer an effective promotional strategy, and interact with their distribution outlets, thereby creating demand for their products and increasing performance. Due to the COVID-19 pandemic owners has no choice but to shut down their business but after the lockdown businesses started to operate again and the number of food retailers and service providers began to rise rapidly. Customers look for unique and quality food that matches its price, Instagram-able places to eat where they can experience quality service, fast delivery of food available whenever customers crave it, and easily find and acquire it anytime and anywhere with the help of different social media applications. Despite applying various mixes of marketing tools, many restaurants have failed to perform over time. In some cases, some stores exist in the market for only a short time. Customers are just eager to know what is new and thrilled to visit new kinds of shops. As a result, some stores boom for months, and then suddenly sales go down.

Many studies have focused on the effect of marketing mix strategies on organizational sales performance and their effectiveness through assessment of the customers. (Ejike, 2020) There is a limited investigation into the assessment of the owners and the effectiveness of marketing mix strategies. (Maina, 2017). The early closure of some food retail and service businesses is one of the reasons why the researcher chose this study. The study seeks to focus on the assessment of the local food retailers and service providers' owners on the effectiveness of the marketing mix strategies as well as the problems encountered in connection with the implementation of these marketing mix strategies. The output of this study can be used to enhance the marketing mix strategies implemented by the business. In a competitive society and business world, a quick change in marketing necessitates adopting and improving business. Otherwise, they would become rigid and inflexible and would almost certainly be vanquished by their competitors. Local food retailers and service providers must keep inventing innovative marketing plans to maintain the extensive publicity that they initially create for their products.

Objectives of the Study

This study aimed to analyze the effectiveness of marketing mix strategies employed by selected local food retailers and service providers. The study specifically seeks to answer the following:

1. Determine the business profile of the respondents in terms of:
    1.1 Geographical Location;
    1.2 Years of operation;
    1.3 Type of food business;
    1.4 Form of Ownership;
    1.5 Estimated gross monthly income;
    1.6 Number of employees.
2. Determine the level of effectiveness of the marketing mix strategies employed by the selected local food retailers and service providers in terms of:
    2.1 Product;
    2.2 Price;
    2.3 Place;
    2.4 Promotion.
3. Determine the problems encountered by the selected local food retailers and service providers in implementing the marketing mix strategies.

4. Determine the significant difference in the level of effectiveness of the marketing mix strategies employed by selected local food retailers and service providers when they are grouped according to the business profile.
5. Based on the findings of the study, what recommendations may be suggested for the enhancement of the marketing mix strategies implemented by the respondents?

METHODOLOGY

Research Design

The researcher used the quantitative descriptive correlational design to assess the effectiveness of the marketing mix strategies employed by the local food retailers and service providers in the fourth congressional district of Quezon Province. The descriptive correlational design can be characterized as simply the attempt to determine, describe, or identify what is; it also allows the collection and association of multiple variables for statistical analysis and a fact-finding scheme design to enable the researcher to interpret the gathered data and information adequately and accurately, as well as the results of the findings.

Participants

The respondents to this study consisted of two hundred thirty-five (235) owners of local food retailers and service providers in the Fourth District of Quezon Province. Restaurants, cafeterias, carinderias, catering services, food stalls, and food carts are common examples of enterprises that prepare the final product and offer it ready to eat. Thus, this study used simple random sampling to give the respondents an equal chance of being chosen. The researcher randomly selected the respondents and made statistical inferences about the population. The sampling also helped ensure high internal validity.

Data Gathering Procedure

To gather the data, the researcher used a semi-structured 5-point Likert scale survey questionnaire format that was validated by the experts. An online and traditional paper questionnaire was used, consisting of three parts. Part I was about the business profile of the respondents, such as their geographical location, form of ownership, years of operation, type of food business, estimated gross monthly income, and number of employees. Part II was questions about the assessment of the respondents on the effectiveness of marketing mix strategies employed in their businesses, and Part III was questions about the problems encountered by the respondents in implementing the marketing mix strategies.

Initially, the researcher gathered the data on the respondent's total population from the Business Permit and Licensing Office of the Local Municipalities in the Fourth Congressional District of Quezon to come up with a sample size of two hundred thirty-five.

Copies of the letter of permission and the questionnaire were sent to the selected respondents through online and traditional paper questionnaires. The researcher also discussed with the respondents the nature, procedures, and purpose of this study, assuring them of their anonymity, confidentiality, and privacy. After the questionnaires were retrieved, collated, and tabulated, they were subjected to statistical treatment.

Ethical Considerations

The researcher obtained written consent that was easily understood by the respondents and attached to the questionnaire to ensure that all the data given was used for research purposes only. To ensure confidentiality and anonymity for the respondents, business names were optional in the questionnaire. No information, such as the participants' names and business names, appeared in the written documents that could identify the participants of this study. Questionnaires were physically delivered to the respondents as well as online. Also, the participants could withdraw from the study at any time, and they were not forced to provide data or answer the questionnaire.

Additionally, researchers used coding to identify participants; they were referred to as participants 1, 2, 3, 4, and so on. This study had no potential risk to the participants because the research involved collecting data in the participants' natural settings.

Data Analysis

After the questionnaires were retrieved and summarized, the gathered data were consolidated, analyzed, and presented in tables. Frequency distribution and percentage were used to present the findings on the business profiles of local food retailers and service providers. Additionally, the weighted average mean was also used to determine the level of effectiveness of marketing mix strategies employed by the respondents and the problems encountered in implementing them to the extent to which the respondents rated or evaluated them according to their interpretation. Lastly, the Kruskal-Wallis H-test was used to measure the significant differences in the effectiveness of marketing mix strategies when respondents were grouped according to business profile.

Findings

Table 1 Business Profile of the Respondents

Geographical Location	Frequency	Percentage (%)	Rank
Alabat	13	5.53	6
Atimonan	42	17.87	2
Calauag	12	5.11	7.5
Guinayangan	15	6.38	5
Gumaca	37	15.74	4
Lopez	56	23.83	1
Perez	5	2.13	9.5
Plaridel	5	2.13	9.5
Quezon	12	5.11	7.5
Tagkawayan	38	16.17	3
Total	**235**	**100.00**	
Years of Operation			
Less than a year	53	22.55	2
1-3 years	94	40.00	1
4-6 years	36	15.32	3
7-10 years	21	8.94	5
More than 10 years	31	13.19	4
Total	**235**	**100.00**	
Type of Food Business			
Catering Service	14	5.96	5
Restaurants	44	18.72	2
Food Truck/Food Cart/Food Stall	37	15.74	4
Carinderia	42	17.87	3
Restobar/Snackbar	4	1.70	6
Food & Beverage retail Store (pizza, milktea, coffee, cakes, pastries, etc.)	94	40.00	1
Total	**235**	**100.00**	
Form of Ownership			
Sole Proprietorship	188	80.00	1
Partnership	47	20.00	2
Total	**235**	**100.00**	
Estimated Gross Monthly Income			
9,000 and below	92	39.15	1
10,000-19,000	66	28.09	2
20,000-29,000	31	13.19	4
30,000 and above	46	19.57	3
Total	**235**	**100.00**	

Shown in Table 1 is the demographic profile of the respondents. In terms of geographical location, it can be noticed that Lopez has the highest ranking with 56 or 23.83% of the respondents while Plaridel and Perez both got the lowest percentage with 5 or 2.13%. Based on Lopez, Quezon profile the municipality has a land area of 355.38 square kilometers or 137.21 square miles which constitutes 4.06% of Quezon's total area, the largest in the Fourth Congressional District of Quezon which consists of 95 barangays. Additionally, according to the 2020 census its total population was 94, 657 the reason why it has the highest number of local food retailers and service providers. The result explains that the number of businesses in a location depends on the size of the municipality and its population. It can be expected that the larger the location, the more populous it is, and the more business opportunities there are.

The table also implied the years of operation of the business with 94 or 40% of the respondents who operated for 1-3 years getting the highest percentage. While 21 or 8.94% of the businesses that operate for 7-10 years got the lowest. The findings were supported by a study by Magboo et al. (2020), which shows that some of the business is already 1 to 5 years in operation. Also, (Magboo et al., 2020) cited (Justia's, 2018) works stating that 70% of new businesses survive at least 2 years because of their commitment to the business and the skills needed to have a successful business. These findings point to the fact that many respondents are start-up businesses.

Additionally, the table illustrates the result in terms of the type of food business, which shows that Food and beverage retail stores got the highest rank with 94 or 40 % of the respondents while Restobar/ Snackbar has the lowest with 4 or 1.70% of the respondents. According to an article by Statista Research Department (2022), in the middle of 2020 food and groceries became the leading commodities purchased on e-commerce sites by Filipino consumers. As a result, in the year 2021, the sales value of food and beverage retailers in the Philippines amounted to 24.36 billion U.S. dollars resulting in the retail food industry growing significantly in sales value yearly. Statista Research Department (2022)

Moreover, the table also revealed that 188 or 80% of the businesses were sole proprietorships while 47 or 20% of the respondents were formed by partnership. According to Webstaurant Store (2018), sole proprietorship is one of the most popular business types in the food service industry and is owned by a single individual. Additionally, (Novak, 2019) stated that sole proprietorships are simple, easy to start, and one of the most common types of business ownership. They are a good option for someone starting a low-risk business on a trial basis.

While in terms of gross monthly income, table shows that the highest rank consists of 92 or 39.15% of the respondents with Php 9,000 and below gross monthly income. On the other hand, the lowest rank has Php 20,000-29,000 which consists of 31 or 13.19%. Most of the respondents in this study was food and beverage retail store owned by sole proprietors which consists of a few employees only and are considered as micro business. Based on a study by Gonzalvo and Avila (2019) entitled Level of Financial Literacy of Micro-Business Owners in the Municipality of Ragay, Camarines Sur, Philippines the average monthly business income of microbusiness was Php 7,000. However as stated, the majority, or 30% of the respondents in the study fell into the Php 5, 000- 9,000 bracket of monthly business income.

It was also stated that local retailers and service providers with 1–5 employees got the highest rank, which consists of 207, or 88.09%, of the respondents. Whereas, the lowest rank consists of 3 or 1.28% of the respondents with 11–15 employees. According to Larson (2023), food trucks, food stalls, or even food carts require 1–8 employees. Additionally, Yankovsky (2023) stated that most food trucks need a team of 3–5 employees to operate successfully during a lunch rush. Usually, a food truck does not need too many employees; it can be operated with a small crew due to its small size and counter service style. The result shows that, as a microbusiness, food retail and service businesses with a small store need only a few employees.

Table 2. Level of Effectiveness of Marketing Mix Strategies Employed by Selected Local Food Retailers and Service Providers in the Fourth Congressional District of Quezon

Product Strategy	**Mean**	**Verbal Interpretation**	**Rank**
1. We sell food that is of the highest quality (taste, freshness, smell, texture, and health effect)	4.61	Very Effective	1
2. We provide a unique, distinctive, and memorable product or service experience.	4.52	Very Effective	4
3. We use excellent customer service as a differentiation element of its service offering strategy.	4.54	Very Effective	2.5
4. As the need arises, we quickly modify products and services to meet changing customer requirements.	4.38	Effective	5
5. We serve food on time according to standard operating procedures	4.54	Very Effective	2.5
Grand Mean:	**4.52**	**Very Effective**	
Place Strategy			
1. The location of our store is accessible and easy to find.	4.52	Very Effective	**1**
2. We deliver our products in the expected given time and at the right place.	4.28	Effective	**3**
3. We accept food delivery online and on mobile phones (call or text).	4.17	Effective	**4**
4. We outsource strategically our ingredients and products from our suppliers.	4.32	Effective	**2**
5. We use multi-channel distribution to deliver food and services based on our market segment.	4.06	Effective	**5**
Grand Mean:	**4.21**	**Effective**	

Pricing Strategy	Mean	Verbal Interpretation	Rank
1. We set product and service prices at a reasonable price (value-based pricing).	4.65	Very Effective	**1**
2. We implement discounted bundle prices.	4.06	Effective	**3**
3. We set the price of our products by adding a fixed amount or percentage to the cost of making and buying the ingredients and raw materials (cost-based pricing)	4.50	Effective	**2**
4. We based our product price on the price of our competitors (competitive-based pricing)	3.69	Effective	**4**
5. We set product and service prices by using odd numbers for the end digits of the price (Psychological pricing, ex. P99, P109, P119)	3.28	Moderately Effective	**5**
Grand Mean:	**3.97**	**Effective**	
Promotional Strategy	**Mean**	**Verbal Interpretation**	**Rank**
1. For promotion, we use personal selling, electronic mail, short message service (SMS), and telemarketing.	3.46	Moderately Effective	**3**
2. We use public relations, publicity, and sponsorships for promotion.	3.20	Moderately Effective	**5**
3. We use online social media platforms such as Facebook, Twitter, YouTube, WhatsApp, and Instagram for promoting products and services and posting customer reviews.	4.03	Effective	**1**
4. We display promo mechanics at the store and store signages for customers (standees, tissue holders, tarpaulin).	3.62	Effective	**2**
5. We use sales promotion tools such as loyalty cards, gifts, price discounts, freebies, free samples, and complimentary services to promote our products and services.	3.34	Moderately Effective	**4**
Grand Mean:	**3.50**	**Moderately Effective**	

Legend: *"Very Ineffective (1.00 – 1.50)", "Ineffective (1.51 – 2.50)", "Moderately Effective (2.51 – 3.50)", "Effective (3.51 – 4.50)", "Very Effective (4.51 – 5.00)"*

Table 2 shows the level of effectiveness of marketing mix strategies employed by selected local food retailers and service providers. In terms of product strategy, it shows a grand mean of 4.51 which isis very effective. The statement "We sell food that is of the highest quality (taste, freshness, smell, texture, and health effect)" has the highest weighted mean of 4.61, which is interpreted as very effective. Meanwhile, the statement "As the need arises, we quickly modify products and services to meet changing customer requirements," with a weighted mean of 4.38 and a verbal interpretation of effective, ranks last. According to Al-Tit (2015) the quality of food and service positively influenced customer satisfaction, and customer satisfaction enhanced customer retention. Moreover, Japor and Nanez (2018) cited Robert (2011) in their study that a firm must provide high-quality products since this strategy helps catch the attention of customers, and this is one of the reasons why firms retain their old and current customers. It shows that one of the best strategies to gain and retain customers is maintaining the quality of the product, particularly the food and service that it offers, which includes its taste, smell, and texture. Being consistent with the quality of the product is one of the factors that makes the customer satisfied.

However, in terms of place strategy the average weighted mean of 4.21 is computed, which is equivalent to effective. Specifically, most of the respondents believe that the location of their store is accessible and easy to find, with the highest weighted mean of 4.52, which means it is very effective. On the other hand, the level of effectiveness of the statement "We use multi-channel distribution to deliver food and services based on our market segment" is effective, which got an average weighted mean of 4.06 but finished last in the ranking. This finding was consistent with what Quilala and Torculas (2016) cited in Hirankitti et al. (2009), which consider place as the ease of access that potential customers associate with a service, such as location and distribution. Furthermore, according to Kotler and Armstrong (2014), retailers should be located near their target customers, thus ensuring accessibility. Retail stores located far away from their customers hurt their purchase intentions. The result implies that the accessibility of the location is a big factor in business and is easy for the customers to buy from time to time with less hassle.

Additionally, results also reveal that the price strategy is effective, with a grand mean of 3.97. In particular, the respondents provided Very Effective on the statement "We set product and service prices at a reasonable price (value-based pricing)" with a weighted mean of 4.65. However, the statement "We set product and service prices by using odd numbers for the end digits of the price" got the lowest rank with 3.28, meaning it was moderately effective. The result shows that using value-based pricing is much more effective than using psychological pricing. Ejike (2020) cited Piercy, Cravens, and Lane (2010) in his study, which revealed that value-based pricing is the most profitable pricing strategy. Additionally, Ejike (2020) also cited Nagle and Holden (2012) in his study that value-based pricing is the price of a customer's next best alternative plus the value of differentiating features.

Hence, in terms of promotional strategy, it shows a grand mean of 3.50 with a verbal interpretation of moderately effective. The statement "We use online social media platforms such as Facebook, Twitter, YouTube, WhatsApp, and Instagram for promoting products and services and posting customer reviews with a weighted average mean of 4.03 and a verbal interpretation of effective ranks first. Unfortunately, the statement "We use public relations, publicity, and sponsorships for promotion" got the lowest average mean of 3.20 with a verbal interpretation of moderately effective. Based on a study by Magboo et al. (2020), customers build trust and confidence in the business because of some advertisements about their experiences. Another factor is social media like Facebook, Twitter, and Instagram because most customers are hooked if they see that it is trending and if it has good reviews. Following the result, the use of social media is now a trend. Anything can be seen on any social media site; promoting a business through it is a big help, easy, and the cheapest way.

Table 3 Problems Encountered by the Local Retailers and Food Service Providers in Implementing the Marketing Mix Strategies

Product Strategy	**Mean**	**Verbal Interpretation**	**Rank**
1. We have difficulty in developing our products and services.	2.49	Rarely Encountered	5
2. We only have limited product development or research involvement.	2.81	Sometimes Encountered	4
3. We experienced a shortage of supplies and high demand in the market	3.44	Sometimes Encountered	2
4. We have direct (substitute) local competitors in the market.	3.57	Often Encountered	1
5. Our consumer's preferences change from time to time.	3.42	Sometimes Encountered	3
Grand Mean:	**3.15**	**Sometimes Encountered**	
Place Strategy	**Mean**	**Verbal Interpretation**	**Rank**
1. Our store has limited access to transportation in the vicinity.	2.39	Rarely Encountered	4
2. Our store is too small to carry well stock of diverse products.	2.98	Sometimes Encountered	1
3. We have trouble sourcing the raw materials needed by the business.	2.62	Sometimes Encountered	3
4. We only have a limited number of delivery riders.	2.95	Sometimes Encountered	2
5. Our store is too far from its target market.	2.24	Rarely Encountered	5
Grand Mean:	**2.65**	**Sometimes Encountered**	
Pricing Strategy	**Mean**	**Verbal Interpretation**	**Rank**
1. We vary our price, usually higher than our competitor's price.	2.40	Rarely Encountered	5
2. We are experiencing an increase in overall operating expenses.	3.62	Often Encountered	1.5
3. We have a high cost of goods sold for all our products offered.	3.07	Sometimes Encountered	4
4. We found that many discounts may not generate enough revenue to cover the costs associated with the business.	3.29	Sometimes Encountered	3
5. We noticed that our customers are too sensitive to product price increases.	3.62	Often Encountered	1.5
Grand Mean:	**3.14**	**Sometimes Encountered**	
Promotional Strategy	**Mean**	**Verbal Interpretation**	**Rank**
1. We lack a continuous program to effectively launch direct selling strategies	2.71	Sometimes Encountered	2
2. We have weak direct selling efforts that do not improve the sales of many products.	2.46	Rarely Encountered	3
3. We are lacking in proper communication with the customers in promoting new products	2.43	Rarely Encountered	5
4. We have an insufficient budget for promotional activities.	2.93	Sometimes Encountered	1
5. We have a high cost of advertising programs that makes it difficult for the business to maintain.	2.45	Rarely Encountered	4
Grand Mean:	**2.60**	**Sometimes Encountered**	

Table 3 revealed the encountered by the respondents in implementing the marketing mix strategies. In terms of product strategy, with a grand mean of 3.15 and a verbal interpretation of Sometimes Encountered. It shows that having a direct (substitute) local competitor in the market ranks first with a weighted mean of 3.57, which means it is often encountered. However, having difficulty developing the products and services got the lowest with a verbal interpretation of rarely encountered and a weighted mean of 2.49. These findings support the current study by Alvarez and Alvarez (2021), which discussed the various problems encountered by the key foodservice store in the Province of Isabela. The study shows that there is stiff competition among the food service stores with 4.68 since this type of business proliferates in the industry. Also stated in the study is that there is an increase in market share for the food service industry with 4.61, which implies that the presence of so many competitors that pop out in the market, whether direct or indirect, greatly affects the market share of each food service company.

While in terms of Place Strategy the average weighted mean of 2.65 is computed which is equivalent to Sometimes Encountered. The highest weighted mean is 2.98 with an interpretation of Sometimes Encountered which indicates that the respondents' store is too small to carry well stock of diverse products and with the lowest weighted mean of 2.24 with an interpretation of Rarely Encountered stating that their store is too far from its target. Therefore, the researcher concluded that most of the respondents' stores were accessible and within the vicinity of the town proper. If a business carries too little inventory, there is a risk of running out of stock, missing a sale, and missing out on cost efficiencies. (Melanie, 2021) This supports (Richard's, 2017) article states that if the products are not readily available in a store regardless of their high quality or well-chosen price points, they will not achieve sales success.

On the other hand, pricing strategy showing a grand mean of 3.14 that results in a verbal interpretation of sometimes encountered. Based on the respondents, in terms of the problems encountered in pricing strategy, the statements "We are experiencing an increase in overall operating expenses" and "We noticed that our customers are too sensitive to product price increases" both got the highest weighted mean of 3.62, which were interpreted as often encountered. On the other hand, the statement "We vary our price, usually higher than our competitor's price" got the lowest weighted mean of 2.40, interpreted as rarely encountered. Bahador (2019) cited Suherly et al. (2016), who found that the price of the service involves considerations related to fixed and variable costs, including labor and material costs. These costs increase from time to time. In addition, the Chartered Institute of Marketing also stated in Bahador (2019) that there are a few things that need to be understood by the company when developing pricing strategies.

Moreover, in terms of promotional strategy, with a grand mean of 2.60 and a verbal interpretation of sometimes encountered. As perceived by the respondents, the statement "We have an insufficient budget for promotional activities" has the highest weighted mean of 2.93 with an interpretation of sometimes encountered, while the statement "We are lacking in proper communication with the customers in promoting new products" was last in the ranking with a weighted mean of 2.43 interpreted as rarely encountered. Based on an article by the Indeed Editorial Team (2022), which discussed the ten challenges in marketing. One of these is the lack of funding or resources. This problem can occur if a business is experiencing losses or if marketing campaigns are not providing a return on investment. Insufficient funds or budgets are a hindrance or may prevent marketers from reaching their potential, slowing a business' growth.

Table 4 Significant Difference in the Level of Effectiveness of the Marketing Mix Strategies Employed by Selected Local Food Retailers and Service Providers When Grouped According to Business Profile

Business Profile	Indicators	K-statistic	p-value	Decision	Remarks
Geographical Location	Product Strategy	16.142	0.064	Accept Ho	Not Significant
	Place Strategy	18.408	0.031	Reject Ho	Significant
	Pricing Strategy	18.891	0.026	Reject Ho	Significant
	Promotional Strategy	14.630	0.102	Accept Ho	Not Significant
Years of operation	Product Strategy	4.636	0.327	Accept Ho	Not Significant
	Place Strategy	3.200	0.525	Accept Ho	Not Significant
	Pricing Strategy	7.775	0.100	Accept Ho	Not Significant
	Promotional Strategy	12.853	0.012	Reject Ho	Significant
Type of Food Business	Product Strategy	10.768	0.056	Accept Ho	Not Significant
	Place Strategy	7.728	0.172	Accept Ho	Not Significant
	Pricing Strategy	4.722	0.451	Accept Ho	Not Significant
	Promotional Strategy	13.154	0.022	Reject Ho	Significant
Form of Ownership	Product Strategy	1.804	0.179	Accept Ho	Not Significant
	Place Strategy	0.975	0.323	Accept Ho	Not Significant
	Pricing Strategy	0.310	0.577	Accept Ho	Not Significant
	Promotional Strategy	6.180	0.013	Reject Ho	Significant
Gross Monthly Income	Product Strategy	1.804	0.179	Accept Ho	Not Significant
	Place Strategy	0.975	0.323	Accept Ho	Not Significant
	Pricing Strategy	0.310	0.577	Accept Ho	Not Significant
	Promotional Strategy	6.180	0.013	Reject Ho	Significant
Number of Employees	Product Strategy	1.804	0.179	Accept Ho	Not Significant
	Place Strategy	0.975	0.323	Accept Ho	Not Significant
	Pricing Strategy	0.310	0.577	Accept Ho	Not Significant
	Promotional Strategy	6.180	0.013	Reject Ho	Significant

Table 4 explained the significant difference of the marketing mix strategies implemented by the respondents when they were grouped according to business profile. In terms of geographical location place strategy with a p-value of 0.031 and 0.026 for pricing strategy, which is lower than the 0.05 level of significance rejected the null hypothesis, thus product and promotional strategy has no significant difference when grouped according to geographical location. Based on an article by Twin (2022), the difference in the price of products and services may also be based on what amount the people in that location are willing to pay, wherein businesses will try to maximize revenue in the markets in which they operate. According to Makgoe (2008), as cited by Sapuro (2016), the location of small and medium enterprises (SMEs) can have a significant effect on costs. This is because the location of an SME determines the transport and distribution costs that will be incurred in the process of delivering products to consumers

On the other hand, promotional strategies rejected the null hypothesis showing that there was a significant difference when respondents were grouped according to years of operation, type of food business, and form of ownership. However, the data accepted the null hypothesis in terms of product, place, and pricing strategies. The result supports the study of (Bustillo et al., 2022) is that there is a significant difference in the level of effectiveness of the strategies implemented according to years of operation during the COVID-19 pandemic. (Bates, 1990), as cited by (Bustillo et al., 2022) stated that the result may be affected by the year of establishment. This result also supports an article that stated that businesses can use different types of promotions independently or in combination to reach their target audiences. (Indeed Editorial Team, 2022) Furthermore, Becker (2021) stated that integrating these elements depends on what a business is promoting; if the owner wants to convince others to buy their product, selecting the best promotional strategy is a must.

In terms of gross monthly income, there is no significant difference in the level of effectiveness of the marketing mix strategies, which means that strategies employed by the respondents have nothing to do with their gross monthly income. With this, income is not considered a factor in determining the effectiveness of marketing mix strategies.

Furthermore, the number of employees showed that there is a significant difference in the effectiveness of place and promotional strategies. The findings agree with Yang et al. (2012) that owners control firm size and are measured by the number of employees in a company, which may significantly influence organizational behaviors and decisions, including strategy. Additionally, in terms of promotional strategy, according to Bakeman & Hanson (2012), as cited by Bennett (2017), small businesses require knowledge of using social media, so utilizing employees with social media experience is beneficial. Employees can understand the customer's situation and treat them accordingly. Since employees have direct contact with customers, they can also be responsive to a customer's needs (Ahmad et al., 2013).

CONCLUSIONS

Based on the findings and outcomes of the study, the following conclusions are presented:

1. The researcher concluded that most of the respondents were from Lopez, Quezon, and owned food and beverage retail stores (pizza, milk tea, coffee, cakes, pastries, etc.) dominate the type of food business of the respondents owned by sole proprietors with 1–5 employees and had been in business for 1–3 years. Most of them earn P9,000 and below in gross monthly income.
2. Respondents need to harness product, price, and place strategy to effectively create competitiveness. While promotion is of less but still need to employ them as it also contributes towards meeting the demand of the customers
3. Even though the marketing mix strategies of the company is effective, there are some problems that the business faced, these are strong competition, having a small store to carry diverse products, an insufficient budget for promotional activities, price sensitivity of customers, and an increase in operating expenses.
4. It can be concluded that food retailers and service providers need to give importance to the location of their business as place strategy influences the distribution of product as well as promotional strategy and place strategy as these strategies significantly differ when grouped according to business profile.

5. Based on the findings of the study, the proposed plan of recommendation can be a factor in improving the business operations of the respondents, and the proper implementation of a suitable strategy may enhance business performance and lessen the problems encountered by the respondents.

RECOMMENDATIONS

Based on the findings and conclusion of the study, the researcher recommended the following:
1. Local food retailers and service providers should continually innovate their marketing mix strategies by providing products or services that are new to the market or by offering newer features or add-on services to their marketing offers.

2. Adopt marketing mix strategies that have the highest impact which is the product strategy on the respondents. They may continue to provide customers with a quality, good-tasting product that matches its price.

3. Respondents must identify their business' unique selling proposition (USP). Because of the strong competition in the market, the USP helps customers understand what makes the product or service different from the competition. They should also engage in intensive promotional activities, taking advantage of available social media opportunities. Additionally, for pricing strategy, the business should improve its cost. For place strategy, a “just-in-time” inventory schedule must be implemented and have a minimal lead time since most of the respondent’s stores were too small to carry diverse products.

4. The researcher recommended considering the differences in the business profiles of the respondents in implementing the right marketing mix strategies suitable for the business.

5. Consider the recommended plan when implementing marketing mix strategies that may enhance customer satisfaction and the profitability of the business.

6. Future researchers may expand the study to other geographic locations and different business industries.

Proposed Plan for the Enhancement of Marketing Mix Strategies Implemented by the Local Food Retailers and Service Providers

Introduction

The number of local food retailers and service providers continue to rise especially after the outbreak of COVID-19 pandemic, some businesses also did not survive when pandemic strikes. The proposed plan focused on enhancing the marketing mix strategies implemented by local food retailers and service providers in the Fourth Congressional District of Quezon and the problems encountered by the respondents in implementing the strategies.

Objectives:

1. To motivate business owners to continually innovate the implemented marketing mix strategies.

2. To identify possible ways to enhance implemented marketing mix strategies, increase customer satisfaction, improve business performance, and maximize profits.

3. To suggest possible solutions to lessen the problems encountered in implementing the marketing mix strategies.

4. To understand that the different marketing mix strategies have different effects on business performance under different types of environments.

SWOT ANALYSIS

STRENGTHS	WEAKNESSES
High quality of food products sold Store is accessible and easy to find Used Value-Based pricing Effective Use of social media platforms	Few multi-channels of distribution Use of psychological pricing was moderately effective Store is too small to carry diverse products Insufficient budget for promotion increase in operating expenses use public relations, publicity, and sponsorships for promotion was moderately effective
OPPORTUNITIES	**THREATS**
Expansion into new geographic locations Store expansion Expanding the variety of food options	direct (substitute) local competitors price sensitivity of customers

Table 5 Proposed Plan for the Enhancement of Marketing Mix Strategies

Areas	Objectives	Strategies	Person's Involved	Expected Outcome
Product Strategy	1.To have a competitive advantage from competitors through product/ service differentiation 2.To analyze the status of different products offered by the store	1.Identify the business' Unique Selling Proposition (USP) ** Offer a convenient, quick-service store that highlights healthier, fresher options than other competitor and food services in the area. **Be consistent with product quality and taste. **Make a strong product/ brand identity to be easily remembered by the customers that differs from the competitors 2.For those consisting of a wider product line, Boston Matrix is useful tool to help a business analyze its product lines.	Owner of Local Food retailers and service providers Employees	Build a competitive advantage among competitors
Pricing Strategy	1.To maximize profits by having the best pricing strategy implemented, but not at the cost of the quality of products and services. 2.To lessen operating and miscellaneous expenses	1.Continuous offering of products and services at a reasonable price. **Cost-based pricing or food-cost percentage can be applied for food retail and service owners. 2.Find low-cost suppliers but do not sacrifice product quality. **Use environmentally friendly recyclable and biodegradable products for packaging **Menu price can be calculated by dividing the food cost (all ingredients) by the target food cost percentage which is typically between 20-40 percent. (Shaak, et al., 2019) ** In product costing, make sure that its products are priced above their cost. Product's total cost must include overheads such as research and development (if any), investment in equipment, people, and technology, as well as direct costs, such as raw materials and ingredients. Also, consider who the target markets are, where are they located and their income as effectiveness of pricing strategy has significant difference on the geographical location of the business.	Local Food Retailers and Service Owners Local Food Retailer and Service Provider Suppliers	Increased Profit/ achieve target sales. Be cost-effective and lessen cost for product packaging.
Place Strategy	1. To properly manage stocks and inventory	1. A "just-in-time" inventory schedule must be implemented and have a minimal lead time since most of the respondent's store were too small to carry diverse products. 2.Be open to the possibility of store and branch expansions	Local Food Retailer and Service Provider Employees Local Food Retailer and Service Provider	Prevent wastage and properly manage stocks and inventory Expand stores and additional branches in other location in the future

Promotional Strategy	1. To reach most of the target market and retain a good number of consumers. 2. To attract consumers in different business promotions	1.Intense advertising and direct marketing through social media platforms, it is very helpful since business can reach majority of its target market and it is free such as Facebook, Instagram, and Twitter. *Facebook page- for basic information, store hours, menu, can also use to entertain questions, concerns, and take-out orders, and various promotional posts. *Twitter- help the business to market real-time, and help to remind customers and consumers of various promotions that may be happening on the following days or weeks. *Instagram- focused on advertising the menu. It must show high quality photographs of the products and some dishes for the customers to know what they will expect from the store, just make sure that it would not be an expectation vs. reality scenario. 2.Advertise through a "Grand Opening" or "Anniversary Promo" event with free food or discounts on food purchases.	Local Food Retailers and Service Providers Employees Local Food Retailers and Service Providers	to gain followers and create brand loyalty, we have to familiarize our market with our service, product offerings, taste, and quality Gain followers and create brand loyalty, also familiarize customers with the product and service the business offers Attract potential consumers and give them a taste of the menu and its quality.

ACKNOWLEDGEMENT

The researcher would like to extend her deepest appreciation and gratitude to the following for making this study possible;

First, the researcher would like to give glory to the **ALMIGHTY GOD** for giving her the blessings of strength, good health, knowledge, and wisdom;

The researcher's adviser, **MARITES C. TAÑADA, DBA,** for her constructive criticism, for sharing her expertise, knowledge, generosity, and professional guidance in preparing and conducting this study, and for the invaluable assistance, suggestions, and encouragement.

The committee on oral examination, headed by Chairperson **ARNEL RODELAS, EdD, Ph.D., LPT, FBE, CPS** for extending his scholarly suggestions, and his indispensable guidance. **ROGEL C. LIMPIADA, DEM, DBA, FBE, and MELCHOR B. ESPIRITU, EdD,** Members of the Panel**,** for guiding and sharing their ideas that further enhanced the outcome of the study;

The research instrument validators**, FRANCIS I. TALAVERA, FELICISIMO E. SANTIAGO, ED.D, HARLENE L. DIMAILIG, MMHRM, LPT** for the enlightenment and for sharing their expertise and ideas through giving suggestions and recommendations;

The respondents, for their time, active participation, and cooperation made the fulfillment of the study and to everyone who directly and indirectly helped in making this study possible, the researcher is deeply indebted to them.

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FUNCTIONS AND ENGAGEMENTS OF LEARNING SUPPORT AIDE AND ITS IMPACT TO THE MODULAR DISTANCE LEARNING IN NORTH DISTRICT, DIVISION OF LIPA CITY

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ABSTRACT

The landscape of education has undergone a transformative shift with the widespread adoption of modular distance learning, especially in response to global challenges. This study aimed to understand the functions and engagements of learning support aide and its impact to the modular distance learning in North District, Division of Lipa City. The research design that was used in this study was the descriptive. The participants of the study were the (11) principals and (66) teachers in School Year 2021-2022 who experienced the situation of modular distance learning. The population or total enumeration for the principals and purposive quota sampling for the teachers were used to select the respondents. The prepared questionnaire was utilized as the main data gathering instrument. The researcher sought the adviser's assistance and panelist's assistance to check the prepared questionnaire's validity. The validation utilized was called face validation. The researcher considered their comments and suggestions in forming the final draft. The researcher employed frequency, weighted mean, ranking and correlation to measure, analyze, and interpret the findings of the gathered data. The analysis revealed that LSA in the teaching process has a significant role in the innovation of the teaching profession. It was also found out that LSA was an excellent asset to the students learning, especially in the new modality of learning. Also, the LSA had a good effect in the DepEd as it gives feedback relative to the welfare of the teachers. Based on the findings of the study, the proposed strategic plan will help the Division of Lipa determine the effectiveness and impact of LSAs.

Keywords: educational support, teaching assistant, home-based learning

INTRODUCTION

The global education system has been seriously affected by the COVID-19 pandemic's worldwide presence. Most countries temporarily closed schools and other educational institutions to limit the spread of the coronavirus (Tria, 2020). Given the epidemiological picture, distance learning has become an essential modality of learning delivery since the year 2020. Learning through printed and digital modules emerged as the most preferred distance learning method for every parent for their child's safety. And regarding health and safety, there is an existing school-family struggle to make education continue amidst the threat of COVID. Having a gap between concerns for safety and the continued education in schools, amid the fear and anxiety of the community and even the education sector.

In response to the crisis and to bridge the gap between school-family, DepEd developed the "Adoption of the Basic Education Learning Continuity Plan in Light of the COVID-19 Public Health Emergency" under DepEd Order No. 012 Series of 2020, which is a package of education interventions that will respond to primary education challenges brought about by COVID-19. DepEd developed the Basic Education – Learning Continuity Plan, which is spelled out as (BE-LCP) and now the Basic Education Learning Recovery Continuity Plan, which is spelled out as (BE-LRCP) to help students of primary education continue learning and for teachers to be able to impart knowledge while maintaining a secure working and learning environment in the face of COVID-19 crisis.

In the S.Y. 2020-2021, the DepEd managed to keep learning while protecting the health, safety, and well-being of all students, teachers, and departmental staff from the threat and uncertainty posed by COVID-19. And modular distance learning was adopted. Even though DepEd continued students' learning through MDL, there still needs to be an improvement for teachers, learners, and school heads. In the S.Y.: 2020-2021, a teacher's struggles during modular distance learning are their absence in supervising their learners in imparting knowledge about the lesson or new lesson. There were instances the teacher possibly visited their learners to distribute modules, check, and follow up with them if they were doing their modules through the immediate assistance of their parents or family, i.e., reading and writing.

For the S.Y.: 2021-2022, the physical absence of the teacher in the teaching-learning process under MDL still affects the students' performance. The students also need help learning because they are not exposed to a classroom setting. They also need help to answer the learning modules, given that their parents serve as their teachers at home. On the parent's side, some have work, so they cannot facilitate teaching their children at home. They struggle due to the lack of time to teach their children. The face-to -face class at S.Y. 2021-2022 did not continue, so the teacher's challenges or struggles continued. For example, in preparing paperwork and printing modules, checking the answered modules, texting parents when and where to get the modules, and making follow-ups with those students who still need to submit their modules.

In lieu thereof, the Department of Education heard all the pleas of the educators, most especially elementary-level teachers who are bombarded with much paperwork and workloads in the school; thus, to close the gap for the educators and learners trigger the Department of Education to find a solution that can address the issues, struggles, and problems of the teachers and the best way to fix it was to hire an LSA. The LSA can lessen the burdensome of elementary teachers because they can directly assist the teachers in printing the modules, reproducing the modules, distributing and retrieving modules, and collaborating or cooperating with the parents on the weekly plan for activity sheets or materials.

In recognition of the need for additional human resources to further support the implementation of the multiple learning delivery modalities under the BE-LCP, the DepEd Memorandum No. 032 Series of 2020 is issued to provide for options and guidelines on the engagement of services of LSAs during the period of national public health emergency, consistent with applicable government rules and regulations. The DepEd issued a memorandum to promote the achievement and progression of learners. As such, DepEd issues this DepEd order on the engagement of services of LSAs to provide specific guidelines, mechanisms, procedures, and funding options for schools with identified needs for workforce support.

In the Division of Lipa City, teachers, and DepEd personnel encounter new challenges and additional tasks; hence, the engagement of the LSA is a way to reinforce and assist learners, teachers, and parents in the implementation of distance learning delivery modalities. The Division of Lipa has implemented DepEd Order No.032 S.2020, funded by its Local Government Unit (LGU) as a Special Education Fund. Participants in the LSA must be educated, have training and experience, be at least 21 years old but at most 59 years old, and preferably be residents of the community/barangay where the school is located. For them, professional teachers in the remaining Registry of Qualified Applicants in S.Y.: 2021 –2022 who are not given permanent or provisional appointments due to a shortage of Plantilla items are considered for getting an LSA in the Division.

The researcher previously worked as an LSA in one of Lipa City's public schools. From her experience, she noticed that being an LSA is a challenging job and that there is a need for strong collaboration with principals and teachers for the success of the teaching-learning process of the students in the MDL. After her contract ended, the researcher learned there was no self-assessment or evaluation form for LSAs. The researcher realized that the principals and teachers must assess the LSAs according to their functions and engagements to determine whether they have helped along the way to implement MDL. In this manner, the importance of the support system provided by LSAs can be determined and can be an influential gauge for deciding on long time provision of LSAs in schools.

To further understand the gap due to the scenario, prompts the researcher to undertake this study to understand further the effectiveness of LSA in their functions and engagements and its impact on MDL in the North District, Division of Lipa City. Also, this prompts the researcher to propose a strategic plan regarding the effectiveness and impact of LSA. The output of this study can be recommended to the Division of Lipa to help determine the effectiveness and impact of LSAs in the North District, Division of Lipa City.

Objectives

The main objective of this study is to understand further the effectiveness of LSA in their functions and engagements and its impact on MDL in the North District, Division of Lipa City.

Specifically, it sought answers to the following questions:

1. What is the profile of the principal and teacher-respondents in terms of:
   1.1 age
   1.2 gender
2. What is the level of effectiveness of Learning Support Aide in terms of the following functions and engagements:
   2.1 assisting in the production of learning modules
   2.2 distributing and retrieving the supplementary activity sheets and other documents
   2.3 coordinating, communicating and guiding parents/guardian with the implementation of weekly learning plan
   2.4 monitoring, tracking and cooperating with teachers on learner's accomplishments and requirements
   2.5 helping teachers in determining the need for intervention.
3. What is the impact of LSA to Modular distance learning as assessed by the principals and teachers in terms of:
   3.1 assisting in the production of learning modules
   3.2 distributing and retrieving the supplementary activity sheets and other documents
   3.3 coordinating, communicating and guiding parents/guardian with the implementation of weekly learning plan
   3.4 monitoring, tracking and cooperating with teachers on learner's accomplishments and requirements
   3.5 helping teachers in determining the need for intervention
4. Is there a significant difference between the assessment of the principals and teachers on the following job functions and engagements?
   4.1 effectiveness of LSA on the functions and engagements
   4.2 impact of LSA to MDL
5. Is there a significant relationship between the:
   5.1 profile of the respondents and their assessment on the functions and engagements of LSA
   5.2 profile of the respondents and impact of LSA
   5.3 assessment on the functions and engagements and impact of LSA
6. Based from the findings of the study, what strategic plan should be proposed to determine the effectiveness and impact of LSA?

METHODS AND MATERIALS

This study is descriptive, for the process mainly involves gathering and collecting information and data thus validates the researcher to use a descriptive research design. It would identify LSA's effectiveness level in the context of MDL. This study used a quantitative research design to emphasize objective measurements and numerical data analysis through the use of questionnaires. The design is validated to be the most appropriate in this study since it aims to determine the Functions and Engagements of Learning Support Aide and Its Impact to Modular Distance Learning in North District, Division of Lipa City through a self-constructed questionnaire and then relying on the statistical results of the respondent's responses. The researcher sought the adviser's assistance and panelist's assistance to check the prepared questionnaire's validity. The validation utilized was called face validation.

The participants of this study were (11) principals and (66) teachers in SY: 2021-2022 who experienced the situation of MDL. The researcher chose the respondents who were principals and teachers since they were directly involved in the distance learning modality. The population or total enumeration for the principals and purposive quota sampling for the teachers were used to select the respondents with relevant experiences with LSA.

To generate the information that would meet the study's objective, the researcher used a questionnaire to know the effectiveness of learning support aide and their impact on modular distance learning.

The instrument was divided into three (3) parts, namely: Part I - the profile of the principal and teacher-respondents in terms of age and gender. Part II - the level of effectiveness of the Learning Support Aide. Part III- The impact of LSA to Modular distance learning as assessed by the principals and teachers in terms of assisting in the production of learning modules, distributing and retrieving the supplementary activity sheets and other documents, coordinating, communicating, and guiding parents/guardian with the implementation of a weekly learning plan, monitoring, tracking and cooperating with teachers on learner's accomplishments and requirements and helping teachers in determining the need for intervention.

In this study, frequency, weighted mean, ranking and correlation coefficient are the statistical tools used to determine the significant relationship between the variables (correlation coefficient) and significant difference between the assessment of the of the principals and teachers (t-test).

To answer the formulated questions, the researcher used the Frequency to determine the number of respondents. Ranking were used to showed the positional importance of an item or object discussed and to determine which item in the questionnaire is given a higher assessment from among the other items. Weighted Mean was used to determine the influence of certain variables in assessing from the five-scale options, of which 5 is the highest, and 1 is the lowest value. Additionally, Equivalent verbal descriptions were used to interpret and explain the numerical data gathered. Lastly, Correlation coefficient was used to determine the significant difference between the assessment of the principals and teachers.

FINDINGS

1. Profile of the Principal and Teacher-Respondents.

For the profile of the principal and teacher-respondents, the age range of 41 – 50 years old for the principal-respondents gained the highest frequency count of five or 45.45% at rank 1 while the age range of 31 - 40 years old got the least frequency count of two or 18.18% at rank 3. For the teacher-respondents, 31 - 40 years old got the highest frequency count of 23 or 34.85%% at rank 1 whereas 20 - 30 years old got the least frequency count of 13 or 19.70% at rank 4. In terms of sex, female yielded the highest frequency counts of eight and 60 or 72.73% and 90.91% at ranks 1 for principal and teacher respondents, respectively. On the other hand, male got the least frequency counts of three or 27.27% and six or 9.09% at ranks 2 for principal and teacher respondents, respectively.

It denotes that most of the respondents had long been in the government service and as educators they attested on the veracity of the new modality of instruction. In Sivasakthi and Muthu Manickam (2012) found that younger teachers (30 years old and below), mature or middle-aged teachers (30 to 40 years old), and older teachers (above 40 years old) do not differ significantly in their teacher effectiveness, indicating that age, whether young, mature, or older, makes no difference to teacher effectiveness.

2. Level of Effectiveness of Learning Support Aide in Terms of Functions and Engagement.

2.1. In Terms of Assisting in the Production of Learning Modules

For the level of Effectiveness of Learning Support Aide in Terms of the Following Functions and Engagement in Terms of Assisting in the Production of Learning Modules, printing the learning modules for the learners obtained the highest rank for the teacher respondents recording a Weighted Mean of 4.73 with Verbal Interpretation of Strongly Agree. On the other hand, among the principal respondents all the functions and engagements obtained similar Weighted Mean of 4.91 with Verbal Interpretation of Strong Agree. This meant that LSA complied and performed well his or her primary obligation which was to help the teachers in printing the learning modules.

The Composite Mean of 4.91 for the Principals and 4.69 for the Teacher-respondents noted that they both strongly agreed that in terms of assisting in the production of learning modules, the Learning Support Aides are effective. It cannot be denied that the LSA provided assistance to the teachers for them to fully accomplish their job or duties in the school and in the daily school activities. The LSA helps the teachers in complying with the educational tasks since they were bombarded with too many workloads.

The production of the modules is one of the Achilles hills of the teachers during the height of pandemic. According to the findings of Castroverde and Acala (2021) challenges of teachers were lodged on how they plan, prepare and distribute modules, monitor students' learning, check, evaluate outputs, and provide feedback on students' performance.

2.2 In Terms of Distributing and Retrieving the Supplementary Activity Sheets and Other Documents

For the Level of Effectiveness of Learning Support Aide in Terms of the Following Functions and Engagement in Terms of Distributing and Retrieving the Supplementary Activity Sheets and Other Documents. The Composite Mean of 4.70 for the Principals and 4.64 for the Teacher-respondents showed that they both strongly agreed on the effectiveness of Learning Support Aide in terms of distributing and retrieving the supplementary activity sheets and other documents. LSA has a big impact to the educational settings because, it lessened the burden of the teachers in terms of production of modules.

The LSA rendered full efforts in giving assistance to the teachers to make sure that quality education was attained, and the goal of the Department of Education was achieved. Lehane's (2016) said that the distribution and retrieval of the supplementary activity sheets and other documents need to be planned and organized very well. In doing so, LSA can assist in preparing and facilitating the distribution and retrieval process.

2.3. In Terms of Coordinating, Communicating and Guiding Parents / Guardian with the Implementation of Weekly Learning Plan

For the Level of Effectiveness of Learning Support Aide in Terms of the Following Functions and Engagement in Terms of Coordinating, Communicating and Guiding Parents / Guardian with the Implementation of Weekly Learning Plan, the principal-respondents noted the equal Weighted Mean of 4.73 in all the items assisting in coordinating with parents the schedule of Weekly Learning Plan distribution, communicating with parents the contents of the WLP and guiding the parents on how to implement the WLP. As reiterated by Barnes (2021) LSA should spend time with the learners during home visitation thus, the LSA should learn to ask the cooperation of the parents at home. On the other hand, the Teacher -respondents noted the item assisting in coordinating with parents the schedule of Weekly Learning Plan distribution, Rank 1 with a Weighted Mean of 4.61 and with Verbal Interpretation of Strongly Agree.

The Composite Mean of 4.73 and 4.54 respectively generalized that both the two groups of respondents have affirmed the effectiveness of the Learning Support Aide (LSA) in terms of coordinating, communicating and guiding parents/guardian with the implementation of Weekly Learning Plan. Notably, the teacher-respondents found the LSA very useful and effective since they can assist in lessening their workloads and heavy tasks in school.

2.4. In Terms of Monitoring, Tracking and Cooperating with Teachers on Learner's Accomplishments and Requirements

For the Level of Effectiveness of Learning Support Aide in Terms of the Following Functions and engagement in Terms of Monitoring, Tracking and Cooperating with Teachers on Learner's Accomplishments and Requirements, both the respondents noted the item assisting the teacher in any other related tasks their Rank 1 with Weighted Mean scores of 4.82 for Principals and 4.58 for Teachers respectively. LSA primarily assisted the teachers in any related tasks like reproducing the modules, tracking of the records of learners and assisting in monitoring their performance. They are also beneficial in enhancing the performance of the learners since monitoring of the learner's performance is prioritized and given more attention especially during their home visitation and direct reporting to the classroom teacher (DepEd, 2020).

2.5. In Terms of Helping Teachers in Determining the Need for Intervention

For the Level of Effectiveness of Learning Support Aide in Terms of the Following Functions and Engagement in Terms of Helping Teachers in Determining the Need for Intervention, both the respondents yielded the item assisting the teacher in checking the learners' outputs to address the learner's needs their Rank 1 with Weighted Mean scores of 4.91 and 4.62 respectively. The items assisting the teacher in designing the learner's possible intervention and guiding the learner and the parents in the successful implementation of the intervention ranked 2.5 with Weighted Mean of 4.64 both for the Principals and ranked 2 and 3 with Weighted Mean scores of 4.47 and 4.44 respectively for teacher respondents.

The LSA can handle well in assisting the parents of the learners as well as checking the learners' outputs because the teacher has no ample time for it. The LSA could render assistance by way of checking the output of the learners so the teacher can determine the area that needs to be improved and developed (DepEd, 2020).

3. Impact of LSA to Modular Distance Learning as Assessed by the Principals and Teachers.

3.1. In Terms of Assisting in the Production of Learning Modules

For the Impact of LSA to Modular Distance Learning as Assessed by the Principals and Teachers In Terms of Assisting in the Production of Learning Modules, based on the Principals' assessment in terms of the impact of LSA in Modular Distance Learning, all the items yielded equally in Rank 2 with Weighted Mean of 4.82 and with Verbal Interpretation of Strongly Agree. However, as per assessed by the group of Teacher – respondents, items printing the learning modules for the learners and arranging the learning modules by subject both ranked 1.5 and obtained Weighted Mean of 4.62. It can be said that LSA has good impact to the teacher's preparation in printing the modules considering the many workloads that they have everyday.

3.2. In Terms of Distributing and Retrieving the Supplementary Activity Sheets and Other Documents

For the Impact of LSA to Modular Distance Learning as Assessed by the Principals and Teachers In Terms of Distributing and Retrieving the Supplementary Activity Sheets and Other Documents, the composite means of 4.85 for the principals and 4.59 for the teacher-respondents affirmed that they strongly agreed on the impact of LSA to Modular Distance Learning in terms of distributing and retrieving the supplementary activity sheets and other documents. It was found that LSA has good impact to the MDL because they can make the task of module and activity sheets distribution, less difficult and challenging. (Dangle &Sumaoang, 2020).

3.3. In Terms of Coordinating, Communicating and Guiding Parents /Guardian with the Implementation of Weekly Learning Plan

For the Impact of LSA to Modular Distance Learning as Assessed by the Principals and Teachers in Terms of Coordinating, Communicating and Guiding parents /guardian, assisting in coordinating with parents the schedule of Weekly Learning Plan distribution both obtained Rank 1 with Weighted Mean scores of 4.73 for Principals and 4.53 for Teachers. Both have Verbal Interpretations of Strongly Agree.

Parents should directly participate in the new modality of instruction and support to whatever activities provided by the teachers. The parents should have a good coordination with the LSA to meet the expectation of rendering quality education despite the pandemic (Dangle &Sumaoang, 2020). The LSA has a good impact to integration of the modular distance learning because, it guides, communicates and coordinates with the teachers over the performance of the learners. Thus, the learning of the students or learners is effectively met.

3.4. In Terms of Monitoring, Tracking and Cooperating with Teachers on Learner's Accomplishments and Requirements

For the Impact of LSA to Modular Distance Learning as Assessed by the Principals and Teachers in Terms of Monitoring, Tracking and Cooperating with Teachers on Learner's Accomplishments and Requirements, the composite mean of 4.61 for the principals and 4.50 for the teacher-respondents noted that they strongly agreed on the impact of LSA to Modular Distance Learning in terms of monitoring, tracking and cooperating with teachers on learner's accomplishments and requirements. The teacher believed that the LSA is a big asset in helping the teachers comply with their working duties in the school. Martin (2017) cited that LSA affords to provide quality educational assistance to the learners. The principal and the teacher strongly believed that LSA can give big innovation to the educational institutions.

3.5. In Terms of Helping Teachers in Determining the Need for Intervention

For the Impact of LSA to Modular Distance Learning as Assessed by the Principals and Teachers In Terms of Helping Teachers in Determining the Need for Intervention, all the items yielded equal ranks from both respondents. The composite means of 4.67 for the principals and 4.47 for the teacher-respondents inferred that they strongly agreed on the impact of LSA to Modular Distance Learning in terms of helping teachers in determining the need for intervention. The LSA has good impact to the learners and parents as they were able to assist them in doing their responsibility of assisting their children over the modules and activity sheets. The illiteracy of parents hindered them to impart the right knowledge to their children. LSA worked directly with the students with additional learning needs and/or operating in a broader capacity across the classroom/school (Salend, 2016). Truly, the LSA can be a catalyst for change and innovation that makes quality education attained.

4. Difference Between the Assessment of the Principals and Teachers on the Following Job Functions and Engagements.

For the difference between the assessment of the principals and teachers on the following job functions and engagements, the responses of the principal and teacher respondents on the effectiveness of LSA on the functions and engagements were compared, the computed t-value of 2.01 for assisting in the production of learning modules has a corresponding p-value of less than 0.05 thus rejecting the null hypothesis.

This concluded that the responses of the two-groups of respondents on the effectiveness of LSA on the functions and engagements in terms of assisting in the production of learning modules have significant differences. Truly, the LSA assisted teachers along the way to a modular scheme and provided learning opportunities using various learning delivery modalities in promoting the progression of learners (Mateo, 2020).

In addition, when the responses of the principal and teacher respondents on the impact of LSA to MDL were compared, the computed t-value of 2.05 for Distributing and Retrieving the Supplementary Activity Sheets and Other Documents have a corresponding p-value of less than 0.05 thus rejecting the null hypothesis. This safely generalized that the responses of the two-groups of respondents on the impact of LSA to MDL in terms of Distributing and Retrieving the Supplementary Activity Sheets and Other Documents have significant differences.

Lastly, the computed t-value of 1.31 for Assisting in the Production of Learning Modules, 0.06 for Coordinating, Communicating and Guiding Parents/Guardian with the Implementation of Weekly Learning Plan, 1.41 for Monitoring, Tracking and Cooperating with Teachers on Learner's Accomplishments and Requirements, and 0.44 for Helping Teachers in Determining the Need for Intervention have corresponding p-values of more than 0.05, thus failing to reject the hypothesis. This safely implied that the responses of the two-groups of respondents on the impact of LSA have no significant differences. The LSA is hired to directly support the teachers and parents to facilitate the students' schooling at home due to the system of education currently being shifted as a response to the threat of the COVID-19 pandemic. Thus, through the assistance provided by the LSA, the parents/guardians are able to support in facilitating and explaining the modules provided for their children (Guiamalon, Alon, Camsa, 2021).

Relationship Between the: Profile of the Respondents and Their Assessment on the Functions and Engagements of LSA; and Impact of LSA to MDL; and Assessment on the Functions and Engagements and Impact of LSA to MDL.

For the relationship Between the age of the Respondents and Their Assessment on the Functions and Engagements of LSA, it was found out that there was a significant relationship Between the age of the Respondents and Their Assessment on the Functions and Engagements of LSA as Assisting in the Production of Learning Modules wherein the p-value is 0.0012 thus, null hypothesis was rejected. It indicates that the LSA can make a difference by assisting the teachers to all the students regardless of their age. The LSA can be a big factor in assisting the education of the students (i-teachers, 2022).

Apparently, it also revealed that there was significant relationship Between the age of the Respondents and Their Assessment on the Functions and Engagements of LSA as coordinating, communicating and guiding parents/guardian with the implementation of weekly learning plan wherein the p-value is 0.0073 thus, null hypothesis was rejected. It could mean that the LSA helps the students by way of home visitation just to retrieve the modules. LSA visited the students regardless of their demographic profile just to serve right education (Briones, 2020).

On the other hand, it was found out that there was no significant relationship between the age of the Respondents and Impact of LSA to MDL as to distributing and retrieving the Supplementary Activity Sheets and Other Documents wherein the p-value is 0.3305 thus, hypothesis was accepted. The students' activity sheet can be retrieved by the LSA in order they can be tracked on how far they get involved in answering their activity or lessons (Salend, 2016). Lastly, there is no significant relationship between the age of the Respondents and Impact of LSA to MDL as Helping teachers in determining the need for intervention wherein the p-value is 0.2749 thus, the null hypothesis is accepted.

For the relationship between the Sex of the Respondents and Their Assessment on the Functions and Engagements of LSA, it was found out that there was a significant relationship between the Between the Profile of the Respondents and Their Assessment on the Functions and Engagements of LSA as to Assisting in the Production of Learning Modules wherein the p-value is 0.0026 thus, null hypothesis is rejected.

For the relationship between the assessment on the functions and engagements of LSA and impact of LSA to MDL, it was found out that the statement of "Assisting in the Production of Learning Modules" has high significant relationship with p-value of 0.0000 which makes the null hypothesis rejected. It could mean that the LSA played a major role in assisting the teachers in the production of Learning Modules (Salend, 2016).

CONCLUSIONS

The following conclusions are made based on this study's objective to determine the effectiveness and impact of Learning Support Aide to modular distance learning provided in this study.

1. The LSA in the teaching process has a significant role in the innovation of the teaching profession because it creates good harmony between the teachers and learners.
2. The LSA was an excellent asset to the students learning, especially in the new modality of learning, and provided confidence to the parents in guiding their children at home during home visitation.
3. The LSA had a good effect in the Department of Education as it gives feedback relative to the welfare of the teachers as the latter feels the challenges of complying with the duties and responsibilities of the teaching profession.

RECOMMENDATIONS

The following are some recommendations that have been derived from the results of the study:

1. The adoption of LSA in the educational system in the Philippines has been found very helpful among teachers and parents.
2. The LSA position should be permanent.

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LEVEL OF FINANCIAL LITERACY OF SELECTED BUSINESS OWNERS IN THE FOURTH CONGRESSIONAL DISTRICT OF QUEZON

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ABSTRACT

This study determined the level of financial literacy – particularly in accounting, costing, and budgeting – of selected business owners in the fourth congressional district of Quezon. It utilized the descriptive-survey research design using a self-made validated questionnaire as a data gathering tool with three hundred seventy-two (372) business owners as respondents who were chosen through stratified random sampling. The gathered data were statistically treated using percentage, mean, Kruskal Wallis H-Test, and Shapiro Wilk W-Test. The findings revealed that majority of the respondents were females, belong to 41 to 50 ages, married, and college graduates. Accordingly, in terms of business profiles, majority of the respondents were from Lopez, classified as merchandising, had running capital of P50,000 or less, and have operated for one to five years. It was determined that the business owners' overall financial literacy was "Literate" in terms of costing and budgeting. However, it was revealed that business owners were "Moderately Literate" in terms of accounting processes and concepts. Additionally, the business owners' top challenge was managing financial records. Finally, there is no significant difference in the level of financial literacy in the three components – accounting, costing, and budgeting – when grouped to age, sex, and civil status. However, there is a marked difference in the financial literacy level of the respondents in terms of educational attainment .

Keywords: Financial Literacy, Accounting, Budgeting, Costing, Business Owners

INTRODUCTION

Financial literacy is defined as the understanding and knowledge of financial concepts and risks. It also looks at how people become more conscious of their financial situation and gradually improve it by adopting financial habits like saving, investing, and planning. Ultimately, this leads to the creation of sound financial decisions. (Elomina, 2021). The International Network on Financial Education of the Organization for Economic Co-operation and Development (OECD/INFE, 2011) defined financial literacy as "a combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being."

Financial literacy is a skill that individuals should be able to equipped themselves, as it is a vital tool for daily living (Philippas & Avdoulas, 2019). People throughout the world spend money based on their needs and wants regardless of their status in society. The capacity of people to spend money gives them the status they desire in the community they lived in. People work hard to earn money and sufficient background in financial literacy, therefore becomes not only a lesson but a necessity among those people who value the importance of better financial literacy in life. Increasing financial literacy can be achieved through financial literacy education. Around the globe, there are several higher education institutions that offer degrees in financial management and accountancy.

In contrast, financial illiteracy can lead to a multitude of financial problems and consequences, such as mental illness, stress, lower self-esteem and miserable experiences. Only 25% of Filipino adults have financial literacy, according to Manila Times (2015). A low level of financial literacy is widespread in developing and developed countries alike (Lusardi & Mitchell, 2011) as shown by a global financial literacy survey conducted by Klapper et al., (2015). Some Filipinos could not be financially literate, which would be detrimental to the country's economic growth. (Lucas, 2018). 4 out of 10 Filipinos have personal debt, which is an above-average percentage, according to a Manulife Financial Corporation survey conducted in the Philippines. Due to this situation, someone who lacks financial literacy will be unable to handle their personal debt effectively and will instead continue to amass it.

The importance of financial literacy for business success has been validated by numerous research. A lack of financial expertise has a negative effect on the company's future. According to the study conducted by Gonzalvo and Avila, business owners should follow the fundamental premise that good business is based on financial literacy and that excellent business increases competitiveness in a globalized society. The capacity to make wise financial decisions, household well-being, and business viability all benefit from financial literacy. Financial carelessness is a cost of a lack of financial literacy. The failure of the business would result from a lack of financial literacy. Financial literacy and a company's operational success are related.

The fourth congressional district of Quezon is the locale of the study is composed of many micro businesses. According to the List of Business Owners in the said area as of 2022, there are11658 businesses which were given permits to operate for the said year. Unfortunately, despite the large number of businesses, no research about the financial literacy of these business owners had been published. Each business owner should evaluate their knowledge, attitude, and conduct about financial literacy issues in order to ensure the survival and growth of their business.

On this premise, the researcher took a step forward in determining how aware in financial literacy are the business owners with stores and branches situated in the Fourth Congressional District of Quezon. Such that they would be able to prevent the various situations of being hooked to malpractice of managing their finances. Additionally, as a contribution of the researcher to those working in the business world, this study offers a proposed financial literacy program that would educate business owners on the benefits and significance of financial literacy.

OBJECTIVES OF THE STUDY

The main objective of this study is to determine the Level of Financial Literacy of Selected Business Owners in the Fourth Congressional District of Quezon.

Specifically, it sought answers to the following questions:

1. What is the personal profile of the respondents in terms of:
    1.1 Age
    1.2 Sex
    1.3 Civil status
    1.4 Highest Educational Attainment

2. What is the business profile of the respondents in terms of:
    2.1 Location of the business
    2.2 Nature of business
    2.3 Running Capital
    2.4 Length of existence of the business

3. What is the level of financial literacy of the selected business owners in terms of:
    3.1 Accounting
    3.2 Costing
    3.3 Budgeting

4. What are the challenges met by the selected business owners in the management of their financial aspects.

5. Is there any significant difference in the level of financial literacy of the selected business owners when they are grouped according to personal profile?

6. Based on the findings of the study, what action plan can be proposed to help the business owners in improving their financial literacy?

METHODS AND MATERIALS

This study used a descriptive approach in order to determine the level of financial literacy among selected business owners in the Fourth Congressional District of Quezon. From the 11,658 local business owners as of 2022, three hundred seventy-two (372) business owners were taken using the Raosoft calculator.

The questionnaire has four major parts and in form of five-point Likert-type scale to determine the degree or quality of answers. The first part (1) of the questionnaire measured the personal profile of the respondents, while the second part (2) measured the business profile of the respondents. Additionally, the third part (3)assessed the level of financial literacy of business owners in terms of accounting, budgeting, and costing. teachers. Meanwhile, the fourth and finally, the last part (4) determined the challenges encountered by the business owners in managing their financial resources.

To establish validity of the means of data collection, the survey questionnaire underwent proper validation process with the help of some research practitioners and experts in the field. The recommendations of these experts were taken into consideration in the finalization of the instrument. After the validation of the research instrument, the researcher advanced to pilot-testing among 20 similar respondents who are not included as respondents.

The collected data was collated, examined, and then presented in tables after the questionnaires had been retrieved and summarized. The following statistical techniques were used by the researcher to quantify the data: Cochran Formula, Frequency-Percentage Distribution, Weighted Average Mean, and Kruskal Wallis H-Test.

To answer the formulated questions, the researcher used the Cochran formula to get the number of samples from the total population. The results on the respondents' personal and business profiles were presented using a frequency-percentage distribution. Additionally, the respondents' level of financial literacy and the challenges they encountered in managing their financial resources were also determined using the weighted average mean. Lastly, Kruskal Wallis H-Test was used to measure the significant differences in the level of financial literacy when respondents were grouped according to personal profile.

RESULTS AND DISCUSSIONS

Table 1. Personal Profile of the Respondents

Personal Profile	Frequency	Percentage (%)	Rank
Age:			
Below 20	3	0.81	5
21-30	84	22.58	3
31-40	95	25.54	2
41-50	132	35.48	1
51 and above	58	15.59	4
Total	**372**	**100.00**	
Sex:			
Male	167	44.89	2
Female	205	55.11	1
Total	**372**	**100.00**	
Civil Status:			
Single	115	30.91	2
Married	241	64.78	1
Widowed	16	4.30	3
Total	**372**	**100.00**	
Highest Educational Attainment:			
Elementary	15	4.03	4
High School	128	34.41	2
Technical Vocational	57	15.32	3
College	154	41.40	1
Master's Degree	11	2.96	5
Doctorate	7	1.88	6
Total	**372**	**100.00**	

Table 1 presents the frequency and percentage distribution of the personal profile of the respondents of this study in terms of age, sex, civil status, and highest educational attainment.

In terms of age, it can be determined that the majority of respondents (35.48%) fall into the 41–50 age range, followed by the 31–40 age range (25.54%). However, it should be emphasized that the percentage of respondents who were 20 years of age or younger was only 0.81%. This shows that the majority of respondents are older adults. In this sense, older people tend to be more financially responsible and have higher levels of financial literacy among business owners. In this way, business owners' ages, which demonstrate greater responsibility in handling money, might be linked to their level of financial literacy. Wilson (2019) also discovered that older people's better financial literacy and experience levels helped to partially explain their normatively appropriate preferences for money-receiving sequences.

In terms of sex, female business owners accounted for 55.11% of the respondents, while men made up only 44.89%. The study by Angeles (2022), which demonstrated that women are more self-employed than men, supports this. It's interesting to note that, per IPSE.UK, self-employed women were more likely than self-employed men to choose aspects related to their personal circumstances and welfare, such as greater control over their schedules and flexibility with regard to childcare.

According to their civil status, the majority of respondents (54.78%) were married, followed by single individuals (30.91%), and widowed respondents (4.30%). A higher percentage of married people work for themselves, according to the same study by Angeles (2022), implying that individuals with more responsibilities need more revenue.

In terms of highest educational attainment, 41.40% were college graduate, followed by High School graduate with 34.41%. However, it can be noted that respondents with doctorate degree holder had 1.88%.According to the report, a higher percentage of business owners have college degrees. The study assumed that the majority of owners would see self-employment as the greatest alternative to unemployment due to a lack of employment opportunities. Baihaqqy et al. (2022) also found an important connection between education level and financial literacy knowledge, which affects investors' financial decisions (Angeles, 2022).This suggests that those with higher education tend to be more financially literate.

Table 2. Business Profile of the Respondents

Business Profile	Frequency	Percentage(%)	Rank
Location:			
Alabat	14	3.76	7
Atimonan	74	19.89	2
Calauag	40	10.75	5
Guinayangan	15	4.03	6
Gumaca	52	13.98	4
Lopez	85	22.85	**1**
Perez	13	3.49	8
Plaridel	8	2.15	10
Quezon	10	2.69	9
Tagkawayan	61	16.40	**3**
Total	**372**	**100.00**	
Nature:			
Service	150	40.32	2
Merchandising	195	52.42	1
Manufacturing	27	7.26	**3**
Total	**372**	**100.00**	
Running Capital:			
P50,000.00 and below	130	34.95	1
P50,001.00-P150,000.00	113	30.38	2
P150,001.00-P300,000.00	54	14.52	3
P300,001.00-P450,000.00	26	6.99	5
P450,001.00-P600,000.00	10	2.69	6
P600,001.00 and above	39	10.48	**4**
Total	**372**	**100.00**	
Average Monthly Sales:			
P20,000.00 and below	93	25.00	**2**
P20,001.00 – P40,000.00	103	27.69	**1**
P40,001.00 – P60,000.00	52	13.98	**4**

P60,001.00 – P80,000.00	37	9.95	**5**
P80,001.00 – P100,000.00	23	6.18	**6**
P100,001.00 and above	64	17.20	**3**
Total	**372**	**100.00**	
Length of Existence:			
less than 1 year	37	9.95	**4**
1 to 5 years	145	38.98	**1**
6 to 10 years	105	28.23	**2**
11 to 15 years	45	12.10	**3**
16 to 20 years	18	4.84	**6**
21 years and above	22	5.91	**5**
Total	**372**	**100.00**	

Table 2 presents the frequency and percentage distribution of the business profile of the respondents of this study in terms of location, nature of business, running capital, average monthly sales, and length of existence.

In terms of the location of the respondents, majority of the respondents were from Lopez with 22.85%, followed by Atimonan with 19.89%. However, it can be noted that respondents from Plaridel had 2.69%. The result is due to the fact that the municipality of Lopez, as of 2022, remains to be the most populated municipality in the district. Additionally, Lopez has been referred to as the "Education Capital of the Province" because it is the location of four of the largest state universities in the country. This means that there are many students, thus, more demand from different goods and services. Finally, the DTI GOV.PH website states that Lopez had the most revenue in 2022, which serves as a proof why there were so many business transactions in the municipality.

In terms of the nature of the business, most of the respondents' businesses were classified as merchandising with 52.42%, followed by service with 40.32%. However, it can be noted that respondents' businesses that were classified as manufacturing had 7.26%. The ideal way to obtain expertise in business management is to launch a retail or merchandising business in the Philippines. Running a merchandising firm, in some way, doesn't require a lot of capital, and the risks involved are manageable. In the study conducted by Donthu&Gustafssin (2020), the COVID-19 pandemic outbreak's business closures, the majority of industry sectors have experienced unprecedented interruptions in business. Short-term issues that retailers and brands must overcome include those pertaining to human health and safety, the supply chain, the workforce, cash flow, consumer demand, sales, and marketing. But this pandemic encouraged a lot of people to explore commerce, particularly buy-and-sell, a kind of merchandising enterprise.

In terms of the running capital, most of the respondents have a capital of P50,000 and below with 34.95%, followed by P50,001 to P150,000 with 30.38%. However, respondents that belong to P450,001 to 600,000 had 2.69%. This means that majority of the business owners in the fourth congressional district of Quezon are considered as micro-entrepreneurs with low financial capital.

In terms of the average monthly sales/revenue, most of the respondents have P20,0001-P40,000 average monthly sales with 27.69%, followed by P20,000 and below with 25.00%. However, respondents with to P80,0001 to P100,000 average monthly sales had 6.18%. The outcome is consistent with the average monthly sales that the majority of business owners report.

In terms of the length of the business, the table shows that most of the respondents have been existing for 1 year to 5 years with 38.98%, followed by 6 to 10 years with 28.23%. It is interesting to know that majority of the respondents are new to the business world. On the economy blog published by the Federal Reserve Bank of St. Louis, as of February 2022, self-employed workers made up almost 11% of the 157 million employed workers in the U.S. The COVID-19 pandemic may have also pushed more workers into self-employment because of an increased burden of in-home child care. U.S. workers faced severe job losses and dramatic changes in the labor market during the COVID-19 pandemic. Additionally, in the paper published by Rappler last April 28, 2021, the government says there are now more Filipinos with jobs amid the pandemic. But these people are self-employed and in the informal sector.

Table 3. Mean Scores of the Level of Financial Literacy of Local Business Owners in terms of Accounting

Accounting	Mean	Verbal Interpretation
As a local business owner, I am aware that:		
1.1 Accounting provides proper recording of our economic and business transactions.	3.08	Moderately Literate
1.2 Accounting records are important basis for the preparation of our financial statements.	3.07	Moderately Literate
1.3 Accounting is applicable and can be helpful in our business and other types and size of businesses.	3.08	Moderately Literate
1.4 Business organizations like ours can be classified into sole-proprietorship, partnership, corporation, cooperatives, etc.	3.06	Moderately Literate
1.5 Each business organization like ours has its own and different accounting treatment.	3.05	Moderately Literate
1.6 Businesses like ours can be classified into 3 types such as service, merchandising, and manufacturing.	3.07	Moderately Literate
1.7 Each business type like ours has its own and different accounting treatment.	3.05	Moderately Literate
1.8 Financial statements help business owners like me and all stakeholders in decision making.	3.07	Moderately Literate
1.9 Financial statements can be classified in to 4 types – balance sheet, income statement, cash flow, and owner's equity.	3.05	Moderately Literate
1.10 Personal assets should be separated in business assets.	3.08	Moderately Literate
1.11 Personal liabilities should be separated in business liabilities.	3.08	Moderately Literate
1.12 Personal expenses should be separated from business expenses.	3.10	Moderately Literate
Grand Mean:	**3.07**	**Moderately Literate**

Legend: *"Illiterate (1.00 – 1.50)", "Least Literate (1.51 – 2.50)", "Moderately Literate (2.51 – 3.50)", "Literate (3.51 – 4.50)", "Highly Literate (4.51 – 5.00)"*

Table 3 shows the level of financial literacy of the respondents in terms of accounting. It registered a grand mean of 3.07 which indicates a moderately literate level. The top indicators of literacy are belief that personal expenses should be separated from business expenses with a weighted mean of 3.10; followed by the beliefs on various ways on how accounting helps business in proper recording, its applicability, the principle of separating personal assets and business assets, and the principle of separating business liabilities to personal liabilities with weighted mean of 3.08.

However, even though all indicators are found to be of moderately literate, the study found out that the knowledge in different accounting treatment in terms of nature and different types of financial statements obtained the lowest mean of 3.05. This can be attributed to the fact that majority of the respondents are not accounting or business graduate. This is also to prove that accounting is not an easy field of study.

Table 4. Mean Scores of the Level of Financial Literacy of Local Business Owners in terms of Costing

Costing	Mean	Verbal Interpretation
As a local business owner, I am aware that:		
2.1 Costing is the process of assigning cost to an element of our business.	3.92	Literate
2.2 Costing is helpful in decision making of our business together with the business owners.	3.93	Literate
2.3 With proper costing, our business may gain profit/positive return.	3.93	Literate
2.4 Without proper costing, our business may suffer loss/negative return.	3.94	Literate
2.5 Costing is crucial in the pricing strategy of our business.	3.92	Literate
2.6 Costing is crucial in calculating the profit of our business.	3.92	Literate
2.7 Proper knowledge of costing gives our company a competitive advantage among our competitors.	3.92	Literate
2.8 Sole-proprietorship, partnership, and corporation use their own level/degree in costing methodology.	3.91	Literate
2.9 Service, merchandising, and manufacturing business use their own costing system.	3.90	Literate
2.10 Costing includes all the direct materials, direct labor and factory overhead used in the conduct of our business.	3.92	Literate
2.11 Costing is crucial in calculating the number of productions of our business.	3.92	Literate
2.12 Costing helps the owners in expanding their business.	3.94	Literate
Grand Mean:	**3.92**	**Literate**

Legend: *"Illiterate (1.00 – 1.50)", "Least Literate (1.51 – 2.50)", "Moderately Literate (2.51 – 3.50)", "Literate (3.51 – 4.50)", "Highly Literate (4.51 – 5.00)"*

Table 4 shows the level of financial literacy of the respondents in terms of costing. It registered a grand mean of 3.92 which indicates a literate level. The top indicators of literacy are belief that costing helps the owners in expanding their business and without proper costing, business may suffer loss/ negative return with a mean of 3.92.

However, even though all indicators are found to be of literate, the study found out that the knowledge that sole-proprietorship, partnership, and corporation use their own level/degree in costing methodology obtained the lowest mean of 3.05. This is explained by the fact that the field of costing is treated differently in terms of corporate structure. Since the majority of respondents are sole owners, they are not familiar with the partnership and corporation's costing procedures.

Table 5. Mean Scores of the Level of Financial Literacy of Local Business Owners in terms of Budgeting

Budgeting	Mean	Verbal Interpretation
As a local business owner, I am aware that:		
3.1 Budgeting is creating a plan to spend wisely the capital in our business.	4.09	Literate
3.2 Budgeting helps our business to determine in advance if we have enough capital.	4.08	Literate
3.3 Budgeting is balancing the income and expenses.	4.08	Literate
3.4 Budgeting helps our business achieve its goals.	4.08	Literate
3.5 Budgeting helps our business in calculating if the company has a favorable or unfavorable returns.	4.08	Literate
3.6 Budgeting allows our business to see its financial strengths.	4.07	Literate
3.7 Budgeting allows our business to see its financial weaknesses.	4.06	Literate
3.8 Budgeting helps our business to be financially stable.	4.06	Literate
3.9 In income, when the actual income is greater than target income, our business has favorable returns.	4.06	Literate
3.10 In income, when the actual income is lower than target income, our business has unfavorable returns.	4.03	Literate
3.11 In expenses, when the actual expenses are greater than budget, our business has unfavorable expenses.	4.03	Literate
3.12 In expenses, when the actual expenses are lesser than budget, our business has favorable expenses.	4.04	Literate
Grand Mean:	**4.06**	**Literate**

***Legend**: "Illiterate (1.00 – 1.50)", "Least Literate (1.51 – 2.50)", "Moderately Literate (2.51 – 3.50)", "Literate (3.51 – 4.50)", "Highly Literate (4.51 – 5.00)"*

Table 5 shows the level of financial literacy of the respondents in terms of budgeting. It registered a grand mean of 4.06 which indicates a literate level. The top indicators of literacy is the belief that budgeting is creating a plan to spend wisely the capital in our business with a mean of 4.09.

However, even though all indicators are found to be of literate, the study found out that the knowledge that in income, when the actual income is lower than target income, business has unfavorable returns and in expenses, when the actual expenses are greater than budget, business has unfavorable expenses obtained the lowest mean of 4.03. This is explained by the fact that the field of budgeting in its technical terms are difficult to analyze by the majority of the respondents.

Table 6. Mean Scores of the Challenges Met by the Local Business Owners in the Management of Their Financial Resources

Challenges Met	Mean	Verbal Interpretation
1. Insufficient Working Capital	3.06	Moderately Encountered
2. Limited Access of Capital	3.36	Moderately Encountered
3. No Allotted Funds for Unforeseen Expenses (Repair, Maintenance, etc.).	2.95	Moderately Encountered
4. Poor Budget Management	2.64	Moderately Encountered
5. Poor Debt Management	2.66	Moderately Encountered
6. Challenges in Maintaining Financial Recording	3.67	Encountered
7. Poor Tax and Business Compliance	2.63	Moderately Encountered
8. Late Payment of Bills	2.63	Moderately Encountered
9. No Segregation of Business and Personal Finances	2.94	Moderately Encountered
10. Poor Costing Tactics	2.68	Moderately Encountered
Grand Mean:	**2.92**	**Moderately Encountered**

***Legend:** "Not Encountered (1.00 – 1.50)", "Least Encountered (1.51 – 2.50)", "Moderately Encountered (2.51 – 3.50)", "Encountered (3.51 – 4.50)", "Frequently Encountered (4.51 – 5.00)"*

Table 6 shows the challenges encountered by the local business owners in managing the financial resources of their business. Challenges in Maintaining Financial Reporting obtained the highest mean of 3.67 with an interpretation of Encountered. This is followed by limited access of capital with a mean of 3.36. However, Poor Tax business compliance and late payment of bills obtained the lowest mean of 2.63.

Table 7. Kruskal Wallis H-Test: Comparison of the Level of Financial Literacy of the Local Business Owners when They are Grouped According to Age

Indicators	Age	Mean Rank	K-statistic	p-value	Decision	Remarks
Accounting	Below 20	247.67	2.628	0.622	Accept Ho	Not Significant
	21-30	192.83				
	31-40	190.37				
	41-50	176.73				
	51 and above	190.07				
Costing	Below 20	235.00	2.847	0.584	Accept Ho	Not Significant
	21-30	189.83				
	31-40	184.50				
	41-50	178.16				
	51 and above	201.42				
Budgeting	Below 20	223.00	3.668	0.453	Accept Ho	Not Significant
	21-30	181.70				
	31-40	185.08				
	41-50	180.19				
	51 and above	208.24				

Note: *"If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."*

Table 7 shows the Kruskal Wallis H-Test of the comparison of the level of financial literacy of the Selected Business Owners when They are Grouped According to Age. As shown in Table 16, the level of financial literacy of the following variables: accounting, costing, and budgeting, across the respondents' age groups has a p-value not less than 0.05, which is insufficient in rejecting the null hypothesis. Holding other variables as constant with a 5% level of significance, there is not enough evidence to conclude that the level of financial literacy of the respondents in terms of the above-mentioned parameters has significant differences across age group/s. Hence, there is no significant difference on the financial literacy level of the respondents in the Fourth Congressional District of Quezon when grouped according to age. This means that across age brackets, the respondents have more or less same level of financial literacy in all the components of financial literacy. The results suggest that present financial attitude and financial behaviors are age factors and insufficient evidence to reflect differences. It is a nature that creates an individual who they are that served them as culture or habit.

On the other hand, the results are contrary to the finding of the study conducted by Financial Literacy Survey (2016) by the Central Council for Financial Services Information of Japan. Results revealed that age is found to be positively related to financial knowledge but negatively related to financial attitude, thus suggesting that middle-aged people in Japan are more financially knowledgeable, but younger and older people are more positive about financial behavior and attitude. In conjunction, Wilson (2019) also revealed that older adults' greater financial literacy and greater financial experience partially accounted for them.

Table 8. Kruskal Wallis H-Test: Comparison of the Level of Financial Literacy of the Local Business Owners when They are Grouped According to Sex

Indicators	Sex	Mean Rank	K-statistic	p-value	Decision	Remarks
Accounting	Male	182.31	0.477	0.490	Accept Ho	Not Significant
	Female	189.92				
Costing	Male	187.11	0.011	0.918	Accept Ho	Not Significant
	Female	186.00				
Budgeting	Male	178.41	1.874	0.171	Accept Ho	Not Significant
	Female	193.09				

Note: *"If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."*

Table 8 shows the Kruskal Wallis H-Test of the comparison of the level of financial literacy of the Selected Business Owners when They are Grouped According to Sex. As shown in Table 16, the level of financial literacy of the following variables: accounting, costing, and budgeting, across the respondents' sex groups has a p-value not less than 0.05, which is insufficient in rejecting the null hypothesis. Holding other variables as constant with a 5% level of significance, there is not enough evidence to conclude that the level of financial literacy of the respondents in terms of the above-mentioned parameters has significant differences across sex group/s. Hence, there is no significant difference on the financial literacy level of the respondents in the Fourth Congressional District of Quezon when grouped according to sex. This means that both male and female business owners in the Fourth Congressional District of Quezon have the same level of financial literacy.

This can be supported by the study of Bagci (2020), which revealed that gender has no significant effect on financial literacy, that the financial literacy is affected by financial education and that there will not be any difference between men and women if women are educated and equipped with financial information as a part of the society.

Table 9. Kruskal Wallis H-Test: Comparison of the Level of Financial Literacy of the Local Business Owners when They are Grouped According to Civil Status

Indicators	Civil Status	Mean Rank	K-statistic	p-value	Decision	Remarks
Accounting	Single	200.99	4.299	0.117	Accept Ho	Not Significant
	Married	181.85				
	Widowed	152.34				
Costing	Single	194.27	2.049	0.359	Accept Ho	Not Significant
	Married	184.77				
	Widowed	156.66				
Budgeting	Single	188.19	0.059	0.971	Accept Ho	Not Significant
	Married	185.55				
	Widowed	188.66				

Note: *"If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."*

Table 9 shows the Kruskal Wallis H-Test of the comparison of the level of financial literacy of the Selected Business Owners when They are Grouped According to Civil Status. As shown in Table 16, the level of financial literacy of the following variables: accounting, costing, and budgeting, across the respondents' civil status groups has a p-value not less than 0.05, which is insufficient in rejecting the null hypothesis. Holding other variables as constant with a 5% level of significance, there is not enough evidence to conclude that the level of financial literacy of the respondents in terms of the above-mentioned parameters has significant differences across civil status group/s. Hence, there is no significant difference on the financial literacy level of the respondents in the Fourth Congressional District of Quezon when grouped according to civil status. This means that single, married, or widowed business owners in the Fourth Congressional District of Quezon have the same level of financial literacy.

Table 10. Kruskal Wallis H-Test: Comparison of the Level of Financial Literacy of the Local Business Owners when They are Grouped According to Highest Educational Attainment

Indicators	Highest Educational Attainment	Mean Rank	K-statistic	p-value	Decision	Remarks
Accounting	Elementary	75.33	134.536	0.000	Reject Ho	Significant
	High School	124.68				
	Technical Vocational	163.31				
	College	241.37				
	Master's Degree	320.50				
	Doctorate	326.21				
Costing	Elementary	82.53	100.257	0.000	Reject Ho	Significant
	High School	133.55				
	Technical Vocational	171.09				
	College	234.67				
	Master's Degree	280.00				
	Doctorate	296.43				

Budgeting	Elementary	130.17	63.121	0.000	Reject Ho	Significant
	High School	142.69				
	Technical Vocational	168.68				
	College	225.30				
	Master's Degree	266.36				
	Doctorate	274.36				

Note: *"If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."*

Table 10 shows the Kruskal Wallis H-Test of the comparison of the level of financial literacy of the Selected Business Owners when They are Grouped According to Highest Educational Attainment. As shown in the table, the level of financial literacy of the following variables: accounting, costing, and budgeting, across the respondents' highest educational attainment has a p-value more than 0.05, which is sufficient in rejecting the null hypothesis. Holding other variables as constant with a 5% level of significance, there is enough evidence to conclude that the level of financial literacy of the respondents in terms of the above-mentioned parameters has significant differences across highest educational attainment. Hence, there is significant difference on the financial literacy level of the respondents in the Fourth Congressional District of Quezon when grouped according to highest educational attainment. This means that elementary, high school, vocational, college, master, or doctoral graduates business owners in the Fourth Congressional District of Quezon don't have the same level of financial literacy. This means that the educational attainment of individuals affects their financial literacy.

This result is congruent to the findings of the study conducted by Ooko (2017), that financial literacy is influenced by schooling. People who have more education are assumed to understand finance better and be more inclined to make wise investing decisions. Therefore, when it comes to saving, budgeting, and choosing investments with higher returns, educated people are better able to manage their finances.

However, this is in contrast of the study conducted by Chu et al. (2017), which evaluated the financial literacy of nations around Asia, lends support to this. Most Asians claimed they were financially educated, although their knowledge of the subject is lacking. This result concludes that educated people are more financially savvy is not founded only on facts.

CONCLUSION

Based on the results from this research study, the following conclusions can be made.

1. In terms of personal profile, most respondents are females, belong to 41 to 50 ages, married, and college graduates. In terms of business profile, most respondents are from Lopez, operating a merchandising type of business, with a running capital of P50,000 or less, and have operated for 1 to 5 years.

2. The Level of Financial Literacy of the respondents is found to be "Moderately Literate" in accounting and "Literate" in Costing and Budgeting.

3. The respondents' most difficult challenge in managing the financial part of their business is maintaining the financial reporting, followed by the limited access to capital.

4. There is no significant difference on the level of financial literacy of the respondents when grouped according to age, sex, and civil status. This indicates that these demographic characteristics do not have an impact on the degree of financial literacy in all of its aspects. In contrast, a marked difference was found in terms of educational attainment in all areas which imply that educational attainment has influence to the level of financial literacy.

RECOMMENDATION

Based on the findings and conclusions of this study, the researcher offers the following recommendations:

1. Since the respondents were dominated by those who have been operating their business from 1 to 5 years, it is recommended for the Department of Trade and Industry to identify business owners needing financial literacy training to directly provide adequate assistance to them through the financial literacy program of the department. Since majority of the respondents have limited access to capital, it is recommended for them to provide a capital to these small business owners or introduce them to different financial institutions that lend capital such as banks and cooperatives.
2. To the businessowners, it is recommended that they expose themselves to various methods for enhancing the skills and knowledge required to manage their businesses successfully, particularly the financial aspect of the business. It is advised that they participate in the government-sponsored trainings. To prevent any loss in the future, it is advised that they have at least a basic understanding of managing funds before starting their own business.
3. Also, future researchers may conduct similar study relative to the level of financial literacy of businessowners – especially those who belong to SMEs – to identify the problem so that they can provide help and guidance to them.
4. It is recommended for the Department of Trade and Industry to provide financial literacy program to businessowners. Trainings and seminars with highlights in budgeting and proper costing will be helpful. However, an emphasis in the accounting aspects is needed so that these businessowners will have a basic understanding in the accounting concepts applicable in business.
5. Since maintaining financial reporting is the most challenging problem of the business owners, it is recommended that a Basic Accounting Literacy Program with highlights in the preparation of Financial Statements should be offered to these business owners in order to directly provide them the basic accounting skills needed. DTI may come up with a Memorandum of Agreement with Higher Educational Institutions offering Accounting and Finance Related programs to have a facilitators, teachers, or speakers who are well-versed in the said field.
6. Since educational attainment has influence on the level of financial literacy, it is recommended for the Department of Trade and Industry to identify business owners with low educational attainment needing financial literacy in order to directly provide them through the financial literacy program. It is also to emphasize that the proposed program should be given to all businessowners but with emphasis to those who have low level of educational attainment.

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GAMIFICATION IN A COLLABORATIVE CLASSROOM AND ITS EFFECTIVENESS IN IMPROVING PROBLEM-SOLVING SKILLS AND MOTIVATIONAL LEVEL OF GRADE VI PUPILS

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ABSTRACT

This study delved into the effects of gamification on problem-solving skills and motivation levels among Grade VI students at Paaralang Elementarya ng Pulangbato. The research employed a sample of 40 Grade VI pupils, divided into two groups: a controlled group undergoing traditional paper-and-pen testing, and an experimental group engaged in a gamified "Snake and Ladder" activity to evaluate their learning outcomes. Employing a pretest-posttest design, data were gathered to assess problem-solving abilities, and a survey was administered to evaluate motivational levels. The findings revealed that the controlled group maintained a highly satisfactory level of problem-solving proficiency throughout both the pretest and posttest phases. In contrast, the experimental group displayed a similar starting point on the pretest, but their posttest results showcased a remarkable improvement, indicating an enhanced problem-solving proficiency compared to the controlled group. Furthermore, learners in the experimental group exhibited higher motivational levels, highlighting the positive impact of gamification on motivation. Importantly, there was a strong connection between students' motivation and their problem-solving proficiency in both groups across pretest and posttest results, underscoring the significance of motivation in enhancing problem-solving skills. Consequently, the study recommends that Mathematics teachers integrate gamification techniques such as rewards, challenges, and interactive gameplay into their teaching strategies to elevate student engagement and performance. The findings also suggest proposing an action plan and encouraging exploration of alternative gamified activities beyond Snake and Ladder to address the gaps identified in the study.

Keywords: Mathematics, Snake and Ladder, Interactive Gameplay

INTRODUCTION

Gamification is a powerful educational tool known for introducing enjoyable elements into non-gaming settings, especially in Collaborative Classrooms (Deterding et al., 2021). This approach offers a unique opportunity to enhance students' problem-solving skills and increase their motivation.

While many gamification methods often emphasize gaming components, it's essential to acknowledge that gamification also involves deep psychological aspects should be understood (Zichermann and Cunningham, 2021). At the same time, differences between individuals and groups in gamification need to be studied, and the game designs to be performed which can affect gamification's effectiveness. Understanding how students behave and what interests them is crucial in optimizing gamification, particularly in subjects like Mathematics. Additionally, investigating how various individuals and groups respond to gamification and how tailored game designs can impact its effectiveness is a significant aspect.

Collaboration within the classroom is a hallmark of 21st-century education according to Laal et al. (2022). Working in collaboration encourages students' active social interaction and help manage cognitive and behavioral developments. Collaborative learning has several reasons that make it effective in the classroom according to Ahmadpanah, et al. (2019), whenever the students are engaged in the subject matter particularly the task rather than just watching and listening to their teacher will make them learn better the concepts. In addition, students who belong to the below average performance do not give up learning and becomes more responsible for their learning for this is accounted to their group overall performance.

The students with above average benefits in the learning structure for they were able to share what they know and able to clarify things for their group members. Collaborative learning also considers the role of each member to put himself or herself in the position of another which leads to the development of social skills of the students. Furthermore, the collaborative structure encourages positive learning to construct with a good observation of student's relationship with peers, which lower the negative attributes like loneliness, social anxiety, and stress.

At present, the country has adopted the K to 12 Basic Education Program. One of the main features of the program is making the curriculum relevant to the learners. In terms of curriculum relevance, Mathematics is compulsory and a pre-requisite for moving from Elementary to the junior and senior high school. Despite the recognition accorded to Mathematics due to its relevance, most students are reluctant in performing better in the subject. The decrease in the result which almost cause to stagnate the mastery level of students in Mathematics is evidently shown in the National Achievement Test (NAT) as it acquired 62.8% in 2005, 46.37% in 2012 to 35.34% in 2018 which are all below the standard proficiency level of 75%. This result is reflected to the performance of Paaralang Elementarya ng Pulangbato with its slow-moving percentage (Alvero, 2016).

Stated in the "Challenges in Basic Mathematics Education" – a publication by the United Nations Educational, Scientific, and Cultural Organization in 2012, are the challenges that are being experienced in the mathematics sector of the Asian region. These include sub-par performance of the students, their poor perception about Mathematics, and failure to see the point of studying them. Here in the Philippines, based on the TIMSS (Trends in International Mathematics and Science Study) of 2013, the last time the regular schools in the country participated, our education sector ranked only 34th of the 38th countries, and on the Advanced TIMSS of 2018, the students of the top schools in the country only scored 355 which is way below the 500 benchmarks (Mullis, et al., 2019).

Foreign studies found that public schools are characterized by pervasive boredom (Pekrun, Goetz, Daniels, Stupnisky, & Perry 2020). With the current educational setup, the country has experienced low Mathematics literacy and appreciation from its students. (TIMSS of 2008 and ADVANCED TIMSS of 2013)

It is very crucial for teachers to think of ways to make pupils' engagements on the subjects. Unfortunately, only some pupils show interest in Mathematics. The personal experience of the researcher over the years shows that interests of pupils to learn decreases except for those who are in the pilot class. The engagement of pupils become limited that result to poor proficiency. For this reason, the researcher was encouraged to think and search for ways to be able to change the learning experience of the students.

Students, prefer to learn while enjoying which the traditional lecture-based learning failed to provide. Most students now are technology engaged, most of them love challenges. Adopting those challenges not in a technological way would probably motivate them in a classroom setting. Simple reward system, challenges and points can give them the motivation especially in their Mathematics subject which most of the students find unexciting.

Since each person has his own personality and tastes, certain game elements can motivate him to play such game. Much more if gamification will be exposed to a collaborative learning environment. Through practices and challenges, pupils will be able to analyze the concepts that would lead to mastery of the lessons. In this study, the focus will be the educational domain. Specifically, to conduct learning environment, which aims to increase the motivation and engagement of pupils in, lectures particularly the operation on signed numbers on its lighter side, which is actually a waterloo for most of students.

Motivation, as a pivotal driver of learning, assumes even greater significance when gamification is integrated into collaborative learning. This approach has the potential to tap into individual preferences, sparking active engagement among students. By incorporating various activities and challenges, students can develop a more profound understanding of complex concepts, making Mathematics more accessible and enjoyable.

The incentives to learning through collaboration have been gaining support during the latter part of the 20th century. Though the current and prevailing assessment method of formal education is still individualistic, learning activities and instruction are shifting. The trend is favoring on learner-centered and collaborative technique on classroom interaction, which aims to attain a more meaningful learning (Wong, 2020). However, the combination of gamification in the classroom and collaborative concept will give greater potential to greater cognitive development of the students inside the classroom.

Making pupils be more engaged in Mathematics class for them to learn spiral concepts like fractions, decimals, ratio, proportion, percent, exponent, integers, solid figures probability and combination with mastery of the competencies and with strong motivational connections to the topic discussed and concepts to be learned, the use of Gamification in a Collaborative-learning environment is encouraged. With this idea, the researcher innovated teaching approach that emphasizes collaborative work of the pupils. The elements of gamification as to reward system, powers, leveling system, badges, competition and experience points will then be implemented in a collaborative Mathematics classroom to effectively acquire problem solving skills.

The researcher believed that through gamification in a collaborative learning environment, pupils can significantly enhance their problem-solving skills and motivation. The researcher aspired to inspire and motivate students, with the ultimate goal of transforming traditional classrooms into engaging, enjoyable, and educationally enriching environments.

OBJECTIVES OF THE STUDY

This study aimed to determine the effectiveness of gamification in a Collaborative Classroom in improving problem solving and motivational level of Grade VI pupils at Paaralang Elementarya ng Pulangbato.

Specifically, it sought to answer the following questions:

1. What is the proficiency level of the controlled and experimental groups on pretest or posttest in the problem-solving skills assessment as to:?
   1.1 understanding;
   1.2 devising;
   1.3 solving; and
   1.4 checking?
2. How can the level of motivation of the respondents be described in terms of:?
   2.1 goal setting; and
   2.2 task accomplishment?
3. Is there a significant difference between?
   3.1 The proficiency level during the pre-test and posttest of the controlled and experimental groups on the problem solving skills assessment?
   3.2 The proficiency level during the pre-test and posttest of the controlled and experimental groups on the level of motivation assessment?
4. Is there a significant relationship between the proficiency and motivation levels of the controlled and experimental group of respondents on the problem solving skills?
5. What is the implication of the findings of the study to the mathematical skills of students?

METHODOLOGY

Research Design

This research, which adhered to the concept of experimentation, assessed how gamified approach subjected to a collaborative learning system gave effect to the problem-solving skills of the pupils and whether it made the pupils motivated in learning Mathematics. In line with this, pre-test-posttest design, an experimental research design was employed in this study. The respondents were selected based on their average Grade (80-83 MPS) to be assigned as controlled group and experimental group. The two groups selected were exposed to a collaborative learning set-up. The experimental group was engaged in gamification while the control group would take conventional activity.

According to Fraenkel and Wallen (2022), the pre-test-posttest design is a common approach used to evaluate the efficacy of an intervention program. In this design, a random set of students is selected based on certain characteristics that fit the qualifications needed for the study. The selected learners were then exposed to the intervention, in this case, gamification. Initially, a pre-test was conducted to determine their initial status before the intervention program. After the utilization of gamification in their studies, the students were given a post-test. The result of the post-test was then compared to the pre -test to conclude findings on the efficacy of gamification in improving the problem-solving skills and motivation of students.

In this study, experimental group with gamified system utilized a reward system, specifically in a form of incentives (snacks and school supplies) which was an important element of gamification. Also, there was a leveling system implemented, wherein the pupils were encouraged to meet the established levels of achievement and development.

Meanwhile, the control group received the conventional instruction and were assessed through traditional pen and paper test. This clear distinction between the experimental and control groups allowed for a comparative analysis of the effectiveness of gamification in enhancing students' engagement and problem-solving performance.

Participants

This study was implemented to forty Grade VI pupils only, belonging to the two identified sections of Paaralang Elementarya ng Pulangbato: Section Eagle and Parrot. Twenty pupils from each section were assigned as controlled group (Eagle) and experimental group (Parrot). The respondents were chosen according to their proficiency level that was defined by their average Grade in second quarter (must be 80-83 MPS). They were grouped heterogeneously and were given pre-test and posttest to determine the effectiveness of gamified approach in improving the problem-solving skills and motivational level of students in a collaborative learning environment.

Table A. Respondents of the Study

Group	Grade Level	Section	No. of Students
Control	6	Eagle	20
Experimental	6	Parrot	20

The table above depicted the total number of respondents from two groups of respondents from Paaralang Elementarya ng Pulangbato who were involved in this study. As shown in the table, both Grade VI-Eagle and Grade VI-Parrot have twenty (20) respondents each that comprised the total of forty pupils.

Data Gathering Procedure

This study was conducted with numerous steps to attain the objectives of the study. First, a self-formulated pre-test and post-test were designed focusing on the problem-solving skills as well as the survey questionnaire intended for the motivational level of students. The first research instrument was used to assess the current level of problem-solving skills of each learner of the two groups while the second one was used to assess how motivated they were after the Mathematics instruction. Then, the teacher-researcher discussed the mathematics lessons for both sections about the Solid Figures; Sequence, Expression, and Equation; and Percentage which were the topics included in the instrument. The difference was that the control group received the traditional pen and paper activity at the end of the discussion while the experimental group engaged to gamified activity known as Snake and Ladder to assess their learning.

The objective of snake and ladder game was to reach the finish line by climbing ladders and avoiding snakes. Each number in snake and ladder board had problem solving question related to the current Mathematics lessons. To perform this activity, the researcher divided the class into two groups, with each group consisting of 10 players. It was initiated by group leaders rolling a dice to know who would be first. Then, each player would take turns rolling a dice, and their game piece would move forward according to the number on the dice. If the player lands on the bottom of a ladder, they could climb up to the higher number. Conversely, if they land on the head of a snake, they slide down to a lower number.

If the pupils answered the question correctly, they would move to the next step and earn some points. The game continued until a player or a team reached the finish line, which could be the last square on the board or a predetermined target. The researcher acknowledged the winners and emphasizes the learning points from the game. The group who won in the game received their rewards (snacks and school supplies).

Subsequently, after the activities had been administered, learners were given a post-test to assess their acquired knowledge and skills under traditional and gamified activities. The pre-test and post-test of the participants were compared, measured, and assessed to prove the efficacy of gamification in enhancing learners' problem-solving skills. In addition, the motivational level assessment was given to them. The researcher then discussed the implications of the results of this study in Mathematics instruction.

Ethical Consideration

It was an institutional standard operating procedure to follow the ethical guidelines-stipulated in the Lipa City Colleges Research and Development Manual. The researcher explained to the respondents the significance of the study. The researcher also assured them that the information they shared would be highly protected and treated with utmost confidentiality. The authors of literature and studies used in establishing the rationale, background of the study and to support the findings of the study were given due citation.

The institutionally formatted informed consents were handed out to the parents/guardians and the teacher adviser of the respondents before the conduct of data gathering using a self-made questionnaire survey form. This was done to consider ethical guidelines for the study. The nature and objectives of the study were verbally explained to build rapport between the researcher and the respondents. Thereafter, the respondents were assured that the data gathered were used solely for academic purposes.

Data Analysis

In response to the statement of the problems set in the study, different statistical tools were utilized to effectively analyze the results of the study.

Frequency. In the context of this study, frequency was used to determine the number of students falling into different proficiency levels in problem-solving and to analyze the distribution of responses on the Likert scale for measuring motivation.

Percentage. This was used to compare the distribution of proficiency levels or motivation between students exposed to gamification and those in conventional learning.

Mean. This was employed to calculate the average pre-test and post-test scores, allowing you to compare the performance of students in problem-solving before and after exposure to gamification.

T-test. This was utilized to determine the significant difference between the pre-test and post-test scores of the respondents in each group, paired t-test was utilized and to determine whether there is a significant difference between pre-test, post-tests, and motivational level, an independent t-test was used.

Pearson-r. This was used to identify significant relationship between the proficiency and motivational levels of the controlled and experimental group of respondents on the problem-solving skills.

RESULTS AND DISCUSSION

This part of the study shows the presentation, analysis and interpretation of the data gathered from the respondents. Such presentation is in accordance with the specific questions posited on the objective of the study.

1. Problem Solving Proficiency Level of Assessment of the Respondents

Table 1. Problem Solving Proficiency Level of Assessment of the Controlled Group

Scores	Pretest			Posttest		
	F	P	R	F	P	R
12 - 15 (Outstanding)	0	0.00	3	5	25.00	2
9 - 11 (Very Satisfactory)	14	70.00	1	12	60.00	1
6 - 8 (Satisfactory)	6	30.00	2	3	15.00	3
Total	**20**			**20**	**100**	
Highest Score	**11 (Very Satisfactory)**			**14 (Outstanding)**		
Lowest Score	**8 (Satisfactory)**			**6 (Satisfactory)**		
Mean Score	**9.30 (Very Satisfactory)**			**10.1 (Very Satisfactory)**		

Legend: F = Frequency P = Percentage R = Rank
O = Often S = Sometimes A = Always

As gleaned in Table 1, for the controlled groups problem solving proficiency level, 14 of them or 70% at rank 1 gained the very satisfactory scores of 9 - 11 during pre-test while six or 30% at rank 2 obtained satisfactory scores of 6 - 8. This indicates that in the pre-test of the problem solving proficiency level of the control group without the utilization of gamification in the collaborative classroom, most gained a very satisfactory score with a frequency of 14, followed by satisfactory scores with a frequency of 6, and the outstanding score with a frequency of 0.

For the post test result, the very satisfactory scores of 9 - 11 made the highest frequency count of 12 or 60% at rank 1 whereas the satisfactory scores of 6 - 8 got the least frequency count of three or 15% at rank 3. This shows that in the pre-test problem solving proficiency level of the controlled group without the utilization of gamification in the collaborative classroom, most gained a very satisfactory score with a frequency of 12, followed by outstanding score with a frequency of 5, and the satisfactory score with a frequency of 3.

The highest scores were 12 (very satisfactory) and 14 (outstanding; the lowest scores were 8 and 6 (both satisfactory); and the average scores were 9.30 (very satisfactory) and 10.10 (very satisfactory) for pre and post-tests of the controlled group, respectively.

Data collected implies that there is a slight improvement given the difference between the rank of and pre-test and post-test scores of the controlled group in terms of problem solving proficiency level wherein the rank 1 in the pre-test scores of very satisfactory with a frequency of 14 and the post-test scores of very satisfactory with a frequency of 12, the rank 2 in the pre-test scores of satisfactory with a frequency of 6 and the post-test scores of outstanding with a frequency of 5, and the rank 3 in the pre-test scores of outstanding with a frequency of 0 and post-test scores of satisfactory with a frequency of 3.

Table 2. Problem Solving Proficiency Level of Assessment of the Experimental Group

Scores	Pretest			Posttest		
	F	P	R	F	P	R
12 - 15 (Outstanding)	0	0.00	3	14	70.00	1
9 - 11 (Very Satisfacto-ry)	13	65.00	1	6	30.00	2
6 - 8 (Satisfactory)	7	35.00	2	0	0.00	3
Total	**20**	**100**		**20**	**100**	
Highest Score	**11 (Very Satisfactory)**			**15 (Outstanding)**		
Lowest Score	**8 (Satisfactory)**			**9 (Very Satisfactory)**		
Mean Score	**9.55 (Very Satisfactory)**			**12.35 (Outstanding)**		

Legend: F = Frequency P = Percentage R = Rank
O = Often S = Sometimes A = Always

As seen in Table 2, the very satisfactory scores of 9 - 11 obtained the highest frequency count of 13 or 65% at rank 1 for the experimental group whereas seven or 35% at rank 2 gained satisfactory scores of 6 - 8. This indicates that in the problem solving proficiency level of the experimental group before the utilization of gamification in the collaborative classroom, most gained a very satisfactory score with a frequency of 13, followed by satisfactory scores with a frequency of 7, and the outstanding score with a frequency of 0.

With respect to the post test result of the same group, the outstanding scores of 12 - 15 got the highest frequency count of 14 orm 70% at rank 1 while the very satisfactory scores of 9 - 11 made the least frequency count of six or 30% at rank 2. This shows that in the problem solving proficiency level of the experimental group after the utilization of gamification in the collaborative classroom, most gained an outstanding score with a frequency of 14, followed by very satisfactory score with a frequency of 6, and the satisfactory score with a frequency of 0.

The highest scores were 11 (very satisfactory) and 15 (outstanding; the lowest scores were 8 (satisfactory) and 9 (very satisfactory); and the average scores were 9.55 (very satisfactory) and 12.35 (outstanding) for pre and post-tests of the experimental group, respectively. Data collected suggests that there is improvement with respect to the difference between the rank of and pre-test and post-test scores of the experimental group in terms of problem solving proficiency level wherein the rank 1 in the pre-test scores of very satisfactory with a frequency of 14 and the post-test scores of very satisfactory with a frequency of 12, the rank 2 in the pre-test scores of satisfactory with a frequency of 6 and the post-test scores of outstanding with a frequency of 5, and the rank 3 in the pre-test scores of outstanding with a frequency of 0 and post-test scores of satisfactory with a frequency of 3.

In this sense, the gamification in the collaborative classroom made a significant effect on the student's proficiency level. As stated by Marzano (2020), of the 60 studies he has been involved in regarding the effects of games on student achievement, "on average, using academic games in the classroom is associated with a 20 percentile point gain in student achievement."

2. Motivational Level of the Respondents

2.1 In Terms of Goal Setting

Table 3. Motivational Level of the Respondents

Items	Controlled Group			Experimental Group		
	WM	VI	R	WM	VI	R
1. I set my goals in improving my proficiency level in Mathematics.	3.58	O	6	4.10	O	4
2. I monitor my achievements in our Mathematics class.	3.80	O	3	3.98	O	7.5
3. I aim to earn points, badges, powers, and rewards.	3.68	O	5	4.03	O	5.5
4. I work hard to increase the rank/level of my Mathematics performance.	4.03	O	1	4.33	A	1
5. I feel competitive during our collaborative activities.	3.18	S	10	3.78	O	10
6. I am motivated to obtain high scores.	3.53	O	8	4.03	O	5.5
7. I make sure to actively participate in every session.	3.98	O	2	3.98	O	7.5
8. I enjoy having collaborative performances.	3.55	O	7	4.30	A	2
9. I allot additional time to study our Mathematics lessons.	3.50	O	9	4.15	O	3
10. I strive to be number one in our Mathematics class.	3.78	O	4	3.95	O	9
Composite Mean	**3.66**	**O**		**4.06**	**O**	

Legend: A = Always; O = Often; S = Sometimes; WM = Weighted Mean; VI = Verbal Interpretation; R = Rank

As shown in Table 3, the respondents from the controlled group assessed that they often work hard to increase the rank/level of their Mathematics performance which got the highest weighted mean of 4.03 and the highest rank of 1. This result implies that without gamification in a collaborative classroom, the students focus on their individual Mathematics performance.

On the other hand, the said group of respondents replied that they sometimes feel competitive during their collaborative activities which made the least weighted mean of 3.18 and least rank of 10. This further proposes that without gamification in a collaborative classroom has little effect on the competitiveness of the students during collaborative activities.

The composite mean of 3.66 signified that the respondents from the controlled group responded that their motivational level was rated as “often”. This suggests that students, although not engaged in gamification, still is motivated in studying in the classroom.

On the part of the respondents from the experimental group, they affirmed that they work hard to increase the rank/level of their Mathematics performance which got the highest weighted mean of 4.03 and the highest rank of 1. This goes to show that gamification on the collaborative classroom has made a significant effect on the student motivation to work hard to increase the rank/level of their Mathematics performance. As studies suggest, regardless of the format of the game, students can simultaneously build their problem solving skills while having fun throughout the process if an instructional game is well-designed (MacKenty, 2016; Harris, 2019).

On the contrary, the said group of respondents answered that they often feel competitive during their collaborative activities which got the least weighted mean of 3.78 and least rank of 10. On this regard, Wright (2017) stated that learners are encouraged by ideas and insights of other learners through reaction and interaction. Collaborative approach exposes learners to the situation that their other peers may have an ability to address a problem or situation in their own background or knowledge.

The composite mean of 4.06 implied that the respondents from the experimental group replied that their motivational level was interpreted as “often”. This implies that gamification in the collaborative classroom significantly affects the motivational level of the students. According to Frianto, et. al. (2016), in their study about application of collaborative models of learning, activities that have team games, and their effects on motivation and social learning outcomes, found out that such models, when implemented in an experimental class setting, can have great enhancements on the learners’ social learning and motivation.

2.2 In Terms of Task Accomplishments

Table 4. Motivational Level of the Respondents in Terms of Task Accomplishments

Items	Controlled Group			Experimental Group		
	WM	VI	R	WM	VI	R
1. I submit my Mathematics tasks on time.	3.50	O	7	4.20	A	6.5
2. I prioritize doing my assignments in Mathematics.	3.75	O	4	4.25	A	5
3. I finish my math tasks easily and quickly	3.75	O	4	3.65	O	10
4. I provide enough time to understand and answer our Mathematics activities.	4.20	A	1	4.15	O	8
5. I feel satisfaction when I accomplish my math tasks.	3.25	S	10	4.60	A	1
6. I work well on my group’s assigned work.	3.45	O	9	4.45	A	3.5
7. I am motivated to finish any Mathematics activity.	3.95	O	2	4.45	A	3.5
8. I actively engage in working on our collaborative tasks.	3.50	O	7	4.50	A	2
9. I am willing to exert effort in our individual and group tasks.	3.50	O	7	4.20	A	6.5
10. I get high scores on our Math activities.	3.75	O	4	3.90	O	9
Composite Mean	**3.66**	**O**		**4.24**	**A**	

Legend: A = Always; O = Often; S = Sometimes; WM = Weighted Mean; VI = Verbal Interpretation; R = Rank

As indicated in Table 4, the respondents in the control group consistently reported allocating sufficient time to comprehend and complete their Mathematics assignments, achieving the highest weighted mean of 4.20 and securing the top rank (1). This outcome underscores that in the absence of gamification in a collaborative classroom, students tend to diligently invest time in understanding and completing their math tasks.

Conversely, members of this respondent group occasionally experienced satisfaction upon the successful completion of their mathematical tasks, yielding the lowest weighted mean of 3.25 and ranking last at 10. This observation further suggests that in the absence of gamification in a collaborative classroom, students may not consistently find high levels of satisfaction in accomplishing their math assignments.

The composite mean of 3.66 conveys that respondents in the control group generally described their motivation levels as "frequent." This implies that students, despite not being exposed to gamification, still exhibit motivation towards accomplishing their tasks in the classroom. The observations regarding the students in the control group maintaining motivation levels despite the absence of gamification align with a relevant study conducted by Smith et al. (2018). In their research, they investigated traditional classroom settings without gamification elements and found that students still displayed intrinsic motivation to complete tasks and engage in learning activities. This study resonates with the notion that students can maintain a reasonable level of motivation within conventional classroom structures.

On the part of the respondents from the experimental group, they affirmed that they always feel satisfaction when they accomplish their math tasks which got the highest weighted mean of 4.60 and the highest rank of 1. This demonstrates the profound impact of gamification in the collaborative classroom on student motivation, emphasizing that the introduction of gamification elements significantly enhances their sense of accomplishment and satisfaction.

On the contrary, the said group of respondents answered that they often finish their math tasks easily and quickly which got the least weighted mean of 3.65 and least rank of 10. This suggests that while they find tasks manageable, they may occasionally seek more challenging experiences, indicating room for further optimization of gamified elements to maintain an appropriate level of challenge.

The composite mean of 4.24 implied that the respondents from the experimental group replied that their motivational level was interpreted as "always". This implies that gamification in the collaborative classroom significantly affects the motivational level of the students in terms of accomplishing tasks, highlighting its consistent positive impact on their engagement and commitment to learning. The findings align with a related study conducted by Johnson and Johnson (2012). In their research, they implemented gamification elements within a collaborative learning environment and observed a consistent increase in student motivation and engagement. These findings support the notion that gamification can consistently enhance students' motivational levels, fostering a more engaging and committed learning experience.

3. Difference Between the Proficiency Level During the Pre Test and Post Test of the Controlled and Experimental Groups on the Problem Solving Skills Assessment; and the Level of Motivational Assessment of the Controlled and Experimental Groups.

Table 5. Difference Between the Proficiency Level During the Pre Test and Post Test of the Controlled and Experimental Groups on the Problem Solving Skills Assessment; and the Level of Motivational Assessment of the Controlled and Experimental Groups

Variables	t-value	p-value	Decision	Interpretation
Problem Solving Skills:				
Pre Test versus Post Test - Controlled Group	1.63	0.11136	p>0.05, Failed to Reject Ho	Not Significant
Pre Test versus Post Test - Experimental Group	5.26	5.90E-06	p<0.01, Reject Ho	Highly Significant
Pre Tests - Controlled Versus Experimental Groups	0.63	0.53246	p>0.05, Failed to Reject Ho	Not Significant
Post Tests - Controlled Versus Experimental Groups	3.64	0.00081	p<0.01, Reject Ho	Highly Significant
Level of Motivational Skills				
Goal Setting	3.80	0.00051	p<0.01, Reject Ho	Highly Significant
Task Accomplishments	4.45	0.00025	p<0.01, Reject Ho	Highly Significant

As revealed in Table 5, when the proficiency level during the pre and post tests of the experimental group were compared, the computed t-value of has a corresponding p-value of less than 0.01, thus rejecting the hypothesis.

These safely inferred that the proficiency level during the pre and post tests of the experimental group have high significant differences. Therefore, gamification has made a significant effect on the proficiency level of the students upon utilization.

In addition, when the proficiency level during the post tests of the controlled and experimental groups were compared, the computed t-value of has a corresponding p-value of less than 0.01, thus also rejecting the hypothesis.

These safely concluded that the proficiency level during the post tests of the controlled and experimental groups have high significant differences. Therefore, it can be implied that there is a difference between a student who is and who is not engaged in a collaborative classroom that utilizes gamification.

As gleaned in the study of Zakaria et.al (2014) studied about the effects of collaborative learning styles of high school learners' mathematical performance in Indonesia. Their study focused on determining the perception concerning cooperative learning through pre-test and posttest. The findings revealed that there is important and crucial difference among the learners' mathematical achievement which can be accounted to the groups' increased comprehension and self-confidence on the part of the learners.

The proficiency levels of the students from the controlled group during pre and post-tests as well the proficiency levels of the students from controlled and experimental groups during pre-tests were found to have no significant differences as evidenced by the obtained t-values with corresponding p-values of more than 0.05. Therefore, it can be implied that without the utilization of gamification in a collaborative classroom, there is no significant effect on the proficiency level of the students.

Moreover, when the responses of the students from the controlled and experimental groups regarding their levels of motivation were compared, the computed t-value of has a corresponding p-value of less than 0.01, thus rejecting the hypothesis.

This safely concluded that the responses of the students from the controlled and experimental groups on their level of motivations have high significant differences. Therefore, it can be implied that there is a difference between a student who is and who is not engaged in a collaborative classroom that utilizes gamification. With this regard, in a study by Russo (2014) that compared the effects of a cooperative learning strategy using quantitative research design, the post-test results of the experiment unit were remarkably higher as shown by the research findings. This finding came in spite of putting into consideration the individual learner's differences in the way they perceived the lessons.

4. Relationship between the proficiency and motivational levels of the controlled and experimental group of respondents on the problem-solving skills.

Table 6. Relationship Between the Proficiency and Motivational Levels of the Controlled and Experimental Group of Respondents on the Problem Solving Skills

Variables	R – value	p-value	Decision	Interpretation
Level of Motivational Assessment Versus Pretest				
Controlled Group	0.40	0.01055	p<0.05, Reject Ho	Significant
Experimental Group	0.62	0.00002	p<0.01, Reject Ho	Highly Significant
Level of Motivational Assessment Versus Posttest				
Controlled Group	0.36	0.02250	p<0.05, Reject Ho	Significant
Experimental Group	0.73	0.00004	p<0.01, Reject Ho	Highly Significant

As reflected in Table 5, when the responses of the students from the controlled and experimental groups on their level of motivation were compared to their proficiency level, the computed r-values of 0.62 for pretest and 0.73 for post-test for experimental groups have corresponding p-values of less than 0.01, thus rejecting the null hypothesis. In addition, the computed r-values of 0.40 for pre-test and 0.36 for post-test for the controlled group have corresponding p-values of less than 0.05, thus rejecting also the hypothesis.

These inferred that the responses of the students from the controlled and experimental groups on their level of motivation have high significant relationships to their proficiency level for pre-test and posttest of the experimental group; and significant relationships for pre-test and post-test of the controlled group. This further implied that the students' level of motivation has a significant relationship with their proficiency level in terms of problem solving. On this note, Franciliso (2012), as cited by Ponce (2019), stated that the academic engagement and academic performance of the students go hand-in-hand. Thus, it further implied that the students who have higher academic engagement tend to have higher academic performance in Mathematics. Conversely, the lower mathematical ability is the lower in their academic performance.

5. Implication of the findings of the study to the mathematical skills of students.

Following the comprehensive collection and analysis of data, a discernible distinction emerged between the initial performance levels of the experimental and control groups in both the pre-test and post-test assessments of problem-solving proficiency. Remarkably, the experimental group exhibited significantly greater progress in terms of their problem-solving skills compared to the control group. This underscores the potent impact of gamification in the collaborative classroom.

Moreover, it is evident that students in the experimental group displayed a notable increase in motivation, particularly concerning goal setting and task accomplishment. Their heightened motivation was particularly focused on working diligently to improve their ranks and levels of mathematical performance. This substantial boost in motivation can be attributed to the gamification approach, which tapped into their innate drive to excel.

Furthermore, the integration of the Snake and Ladder gamified activity emerged as an especially effective strategy for enhancing students' problem-solving proficiency. Those exposed to gamification in a collaborative classroom demonstrated superior skills in comprehending, formulating, resolving, and validating mathematical problems. Their heightened engagement and motivation, fostered by the gamified approach, translated into superior results compared to their peers engaged in traditional pen-and-paper activities.

In essence, gamification served as a powerful catalyst for improving students' mathematical skills. It not only encouraged increased effort in grasping mathematical concepts but also cultivated a heightened interest and enthusiasm for learning. Moreover, collaboration and the reward system inherent in gamification played a pivotal role in motivating students to participate actively, ultimately providing them with an environment conducive to refining their problem-solving abilities. The impact of gamification on students' mathematical skills stands as a testament to its effectiveness in enhancing educational outcomes.

The study's findings also shed light on several key aspects of gamification that can be effectively harnessed in teaching mathematical problems.

First and foremost, gamification significantly enhances students' problem-solving skills, making it a valuable tool for educators aiming to improve this critical competency. Additionally, the heightened engagement resulting from gamified elements, such as rewards and competitive features, can promote better comprehension and retention of mathematical concepts. Moreover, the study underscores the importance of motivation and goal setting within the gamified context, which can translate into increased efforts and improved performance in Mathematics.

Collaborative learning, facilitated by gamification, emerges as another promising avenue for enhancing mathematical understanding. The incorporation of reward systems and the ability of gamification to generate enthusiasm and interest among students further highlight its potential in teaching mathematical problems.

CONCLUSIONS AND RECOMMENDATIONS

This part presents the conclusions and recommendations raised for the improvement of this study.

Conclusions

Based on the abovementioned findings of the study, the following conclusions were drawn:

- Controlled group maintained satisfactory problem-solving proficiency without gamification, while the experimental group showed outstanding posttest results, indicating significant improvement.
- Gamification had a notable influence on the motivational levels of learners, with the experimental group displaying higher motivation compared to the controlled group.
- No significant difference in proficiency for the controlled group between pretest and posttest, suggesting conventional instruction had limited impact. In contrast, the experimental group exhibited a significant improvement in problem-solving skills with gamification.

- Strong relationships observed between motivation and proficiency in problem-solving skills for both controlled and experimental groups, emphasizing the crucial role of motivation.
- Overall, gamification significantly impacted both proficiency and motivation in problem-solving tasks, as evidenced by outstanding results in the experimental group compared to the controlled group.
- Incorporating gamification techniques in collaborative classrooms is recommended for enhancing proficiency and motivation among students in problem-solving tasks.

Recommendations

Based on the findings and conclusions, the following recommendations are hereby suggested:

- Maintain conventional instruction for proficient problem solvers; consider incorporating gamification for students needing improvement.
- Explore integrating gamification elements, like reward systems, to boost motivation and create an interactive learning environment.
- Incorporate gamified activities into the curriculum to effectively enhance student learning and motivation, supplementing traditional methods.
- Prioritize strategies to enhance student motivation, with a focus on gamification's positive impact on motivation and problem-solving skills.
- Consider incorporating gamification techniques into teaching practices, especially for students in need, to enhance proficiency and create a motivating learning experience.
- Recommend this study's outcomes to future researchers for assessing gamification's impact on problem-solving skills and student motivation.

ACKNOWLEDGMENT

The completion of this research study has been a challenging but rewarding journey. The researcher extends sincere gratitude to all who contributed to the preparation and writing of this scholarly paper. Special thanks to God Almighty for providing health, strength, and guidance throughout the study.

Ms. Mabel G. Campang, Head Teacher I at Paaralang Elementarya ng Pulangbato, deserves heartfelt appreciation for her kind consideration, constant guidance, and professional suggestions. The researcher is also grateful to Dr. Lino Balantac, the statistician, for sharing expertise and providing unwavering support and encouragement.

A special thank you to the loving family for being a constant source of inspiration and strength, offering unwavering support, motivation, care, and understanding throughout the researcher's academic journey.

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THE EFFECT OF YOUTH FORMATION AND INVOLVEMENT IN COMMUNITY DEVELOPMENT ON THE PSYCHOSOCIAL TRAITS

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ABSTRACT

The study aimed to determine the effect of youth formation and involvement in community development on psychosocial traits of Barangay Panas Candijay, Bohol during the year 2023. The findings of this study served as the basis for proposing an action program. The study employed a descriptive-correlational methodology with the aid of modified questionnaire adapted from Sugut, et al., (2018), and Engida (2020) to generate data on youth involvement and psychosocial traits respectively. The study was conducted in Barangay Panas which is composed of 573 youth community residents whose ages vary from 10-24 in the year 2023. In particular, there are 293 males and 280 females. All gathered data was subjected to statistical treatment. The results revealed that both the youth formation and youth involvement are significant predictors of learners' psychosocial effects. Moreover, the r-square of 0.639 signifies that almost 64% of the variability of the learners' psychosocial effects can be explained by the youth formation and involvement and more than 36% can be explained by other variables. This denotes that youth formation greatly influenced the learners' psychosocial traits. This study concludes that the youth involvement in community development as the youth formation was highly implemented in the community. These involvements influence their psychosocial traits. Moreover, the correlation coefficient value denotes that youth formation and involvement are attributed to the increase of psychosocial traits. Therefore, as the level of youth formation increases, the level of psychosocial traits also increases.

Keywords: Community Development, Psychosocial Traits, Youth Formation

INTRODUCTION

Youth involvement in community development is vital to improve one's psychosocial that contributes not just a single community but improves society as a whole. Through their active participation, youth gradually learns crucial life-skills, various knowledge on human rights, citizenship, and even promoting positive civic action (United Nations, 2011).

However, despite the motivations and influences, there are some factors that prevent participation of youths in community development which decreases the level of the interrelation on behavioral and social factors (Aghakhani, 2015). In particular, there is a need for a sense of belonging, communication, and making them the target of the program since it is palpable that the majority of youth these days do not engage in anything of no benefit to them (Ben, 2021).

Apparently, the absence of youth's active participation leads them to becoming 'social outsiders'. They could be oblivious to societal activities which may result in negative effects on their psychosocial (Poole, 2018). Eventually, they will find it difficult to understand society itself. To be exact, they can neither truly understand it nor grasp its presence. That leaves to the fact that the absence of their participation in community would lead them fully inactive and uncommitted citizens (Poole, 2018).

In the Philippines, there are 30 million young people who are 10-24 and account for 28% of the Philippine Population (UNFPA). This clearly reveals an opportunity to strengthen the capacities of youth to become the next generation

According to Ehnorh (2019), youth is best defined as a person's period of transition where a person transforms from a dependent to an independent adult. In addition, youth are considered as a backbone of a society and hence they determine the future of a certain society. It is further explained that youth of all of the other age groups, the kids, teenagers, middle aged, and senior citizens rely on them and expect a lot from them (Shoaib, 2020). Several youths tend to spend some of their time contributing to particular communities wherein their involvement positively affects their psychosocial and patriotism.

Moreover, youth is believed to be an essential stage in both current and the future society. Conclusively, due to the growing dependence on youth, they play the role with the knowledge that their families, communities, and the country lies in their hands (Shoaib, 2020).

Based on the United Nation, the youth comprises 16 percent of the world's population. In particular, 28 percent of the Philippine citizenry is composed of the youth sector or those belonging to the age range of 10 to 24 years (United Nations, 2022). Thus, it is safe to assume that the youth has a great importance when it comes to shaping and improving the society because they have the capability to determine the future, not only of a single community or nation but they can also shape the future of the globe (United Nations, 2022).

According to Htet (2022), social factors and political and legal factors are two of three factors that have a solid influence on community participation. Moreover, youth's involvement in their communities was believed to be mainly supported by their families' and encouraged by their peers. Basically, several ways in which a young person's social group can encourage him or her to participate in community development projects, such as volunteering, giving back to the community, and joining student unions.

Mohamed, et al., (2019), stated that the development of the country will inevitably involve the development of the current younger generation since they will soon take leadership of the country. It is further noted that the youth should not be ignored in the country's development scheme plan. Mohamed, et al., (2019) suggests that there is a need to focus on the youth, particularly on the development of their patriotic spirit.

Evidently, youth involvement in community planning, decision-making, and action were not observed in the past. However, in today's generation with their community's support, it is noticeable that youth are becoming involved in community development (GGAI, 2022). Additionally, the collaboration among youth benefits the community, particularly the non-profit organizations as they volunteer to programs and nongovernmental organizations. Conversely, these involvements help youths become empathetic citizens who could potentially continue similar work when they become adults. Additionally, youths who give back to their communities develop leadership as a result of psychosocial and patriotism through youth involvement in community development (GGAI, 2022).

The psychosocial development theory states that individuals are shaped by and react to their environment. For this reason, the theory may prove to be a useful tool in many fields, including social work. Psychosocial development theory can be utilized in the analysis of a client's symptomatic behavior in relation to past traumatic experiences and conflicts with current developmental tasks. Erikson's theory postulates that people advance through the stages of development based on how they adjust to social crises throughout their lives. These social crises instruct how individuals react to the surrounding world. This provides social work professionals with a group of signals that help determine how successfully clients handle crises and progress along with a "maturation timetable" (Erikson, 1950).

Erikson (1950) further explained changes in self-understanding, social relationships, and one's relationship with society from infancy through later life. Peers, family, and their messages about a child are worth influence their self-worth. According to Erikson, successfully resolving the eight developmental stages to have a healthy personality and acquisition of essential virtues needed to overcome crises later on in life (Theyer, 2008)

The trust vs. mistrust is the first stage in psychosocial development. This stage starts at birth and continues until 18 months old during this stage. The infant is uncertain about the world; therefore, they rely on their primary custodian for stability and consistency of care. If an infant receives consistent and reliable care, they will start a sense of trust, which will help them carry out relationships with others. The undeveloped stage well then develops anxiety, Mistrust, and suspicion may develop (McLeod, 2018).

As to autonomy vs. shame, the stage occurs from 18 months to approximately three years of age. At this stage, children focus on a sense of personal control over physical skills and independence. Children at this stage must be encouraged and supported to increase their independence. We are helping them become confident and sure of their ability to survive. Therefore, if a child is strictly controlled or not allowed to profess themselves, they begin to feel unable to survive, become overly dependent on others, have insecurities, and feel a sense of humiliation or doubt in their abilities (Orenstein, 2021)

In terms of initiative vs. Guilt, children began to advocate themselves more frequently through play and socially interacting with others. This stage is lively and rapidly developing in a child's life. In this stage, parents may observe children regularly interacting with other children in school. The center of this stage plays because it provides them to explore and discover their interpersonal skills through initiating activities. They began planning activities, making games, and even conducting activities with others. If this stage is satisfied, a child may develop initiative and security in their ability to lead and make decisions. However, not meeting this stage due to criticism and restriction, a child may develop a sense of Guilt or often overstep his forcefulness. The dangerous part is that the parents will punish this behavior and overly criticize his initiatives to grow. Once a parent treats this as a nuisance and trivial or embarrassing, a child may develop a sense of Guilt. Guilt can slow a child's interaction with others and may hinder their creativity. Some guilt is necessary, so a child may know how to exert self-control or have a conscience (David Elkind, 1970).

However, the industry vs. inferiority happens between the age of five and twelve. Children will learn to read, write, add, and do independently at this stage. Teachers began to partake in the child's life by teaching specific skills. Peer groups will also gain greater significance, boosting a child's self-esteem. At this stage, a child feels the need to win approval by showing off specific competencies that are important in society, and they begin to develop a sense of grace in their accomplishments.

Moreover, if a child is encouraged and supported for their initiative, they will begin to feel competent and confident in their ability to achieve their goals. Hence, if it is not encouraged and restricted by the parents or teachers, a child may feel inferior and doubtful of his abilities; therefore, he may not reach his full potential. Once the child cannot develop specific skills, they may feel that society is demanding and may feel a sense of Inferiority. Some failure is vital so children will learn modesty based on the study of Nancy Lovett, 1986.

The stage of identity vs. role confusion happens during adolescence from 12-18 years. Adolescents will seek themselves and their identity in this stage by exploring personal values, goals, and beliefs. This stage is the most important since this is the transitioning stage from childhood to adulthood. Children become independent and look at the future in their careers, relationships, families, housing, and others. It is a crucial stage of development because the child has to identify the roles he will choose as an adult. Individuals start to search for a sense of belongingness in society to fit in. At this stage, adolescents will re-examine their identity and try to find out who exactly they are. At the end of this stage, a sense of self -worth, of what one wants to do or become, is gender identity. In this stage, their body image changes (Newman, 2020).

On the other hand, the intimacy vs. isolation happens during young adulthood at ages 18 to 40. This stage revolves around making intimate and loving relationships with others. This time we start to share ourselves intimately with others. We are exploring relationships towards longer-term commitments with an intimate partner besides family members. Completing this stage will eventually result in happy and healthy relationships with a sense of commitment, care, and safety. Fearing commitment will eventually be led to Isolation and loneliness that sometimes results in depression (Taylor, 2009).

Lastly, generativity vs. stagnation happens during middle adulthood, ages 40 to 65. Individuals at this age may experience the need to create or nurture things that create positive changes to help other people. Giving back to society is through raising our children, being productive at work, and becoming more involved in community organizations and activities. Overcoming this stage gives off a sense of usefulness; meanwhile, failure to do so results in shallow involvement in the world (Newton, 2019).

Statement of the Problem

The study aimed to determine the effect of youth formation and involvement in community development on their psychosocial traits of Barangay Panas Candijay, Bohol during the year 2023. The findings of this study served as the basis for proposing an action program.

1. What is the profile of the respondents in terms of sex, age, marital status, educational attainment and number of community involvement?
2. What is the respondents' assessment on the youth formation as to maka-Diyos, makatao, maka-kalikasan and makabansa?
3. What is the respondents' level of involvement in community development?

4. What is the perception of the respondents on the psychosocial traits of youth in terms of confidence, competence, compassion and character?
5. How do youth formation and involvement influence psychosocial traits?

RESEARCH METHODOLOGY

Design

The study employed a descriptive-correlational methodology. Thus, this is a quantitative study. This strategy was chosen by the researchers to get numerical data to see if there was a correlation between the effects of youth involvement in psychosocial traits in Barangay Panas. This design provided an outline of actual thoughts, emotions, and actions within a certain category of individuals. The descriptive-correlational research design was used in the study which is relevant to the study, to measure both the description and the relationship of the elements.

Environment and Participants

Panas is a barangay in the municipality of Candijay, in the province of Bohol. Its population as determined by the 2020 Census was 1,767. This represented 5.87% of the total population of Candijay. In particular, Panas is situated at approximately 9.8309, 124.5416, in the island of Bohol. Elevation at these coordinates is estimated at 16.6 meters or 54.5 feet above mean sea level.

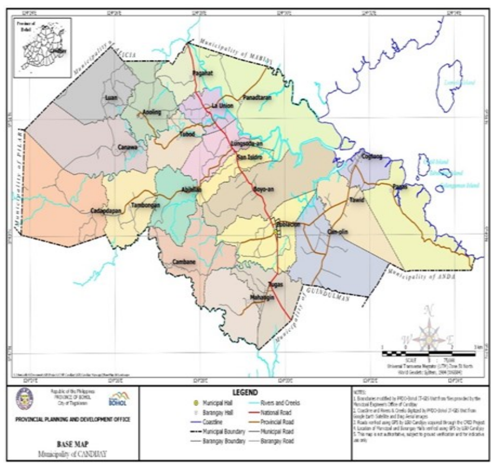

Figure 1. Map of Candijay, Bohol

The study was conducted in Barangay Panas which is composed of 573 youth community residents whose ages vary from 10-24 in the year 2023. In particular, there are 293 males and 280 females. The respondents were selected randomly per purok based on their sample size.

Instrument

The researchers utilized a modified questionnaire adapted from different sources to conduct a survey. The questionnaire was divided into five parts, namely: part I, will be used to generate information on the demography of the respondents; part II will be used to collect information on the level of influence on youth involvement adapted from Sugut, et al., (2018).

Part III was used to gather data on the level of community involvement adapted from Engida (2020) which consists of a 9 item test. Part IV was utilized to identify the level effects on psychosocial traits which is composed of 4 dimensions: confidence, competence, caring, and character. It consists of a 30 item test adapted from Bloomquist (2010).

Procedures

To get the approval, the following procedures will be done; the researcher will draft the questionnaire, and then will be distributed among the youth respondents in Barangay Panas. The researcher will follow the strict compliance of the health protocol. Finally, the questionnaires will be gathered, retrieved, collated and subjected to statistical treatment.

Statistical Treatment

To determine the profile of the respondents, percentage was used. Moreover, to determine the level of influence and psycho-social of youth on community involvement in community development, weighted mean will be used. Lastly, multiple regressions were used to determine the effect of youth formation and involvement on their psychosocial traits.

RESULTS AND DISCUSSION

This section expounds all the data gathered using the questionnaire. It also shows the interpretation and discussion in each data presented to identify effects of psychosocial on youth formation and involvement in community development in Barangay Panas, Candijay, Bohol that will serve as the basis for proposing an enhancement program.

The table 1 presents the demographic profile of the youth-respondents in terms of sex, age, marital status, educational attainment, and length of community involvement.

Table above shows that in Barangay Panas, Candijay, the majority of the youth involved in community development are Male with a frequency of 197 or 52.12% out of the 378 youth-respondents. On the contrary, the Female has the lower frequency of 181 or 47.88%. This implies that there is a slight difference between these sexes in terms of community involvement.

The youth-respondents' age range is from 10-24. Majority of the respondents aged between 10-14 which totalled 157 or 41.53% out of 378 respondents. On the contrary, the minority aged above 24 or 2.38%. This implies that the youth respondents have not already reached adult legal capacity. Researchers assume that youth members become more inactive in community involvement as they get older.

Table 1. Demographic Profile of the Respondents
N = 378

1.1 Sex	**Frequency**	**Percentage**
Male	197	52.12
Female	181	47.88
Total	**378**	
1.2 Age		
10-14	157	41.53
15-19	128	33.86
20-24	84	22.22
Above 24	9	2.38
Total	**378**	
1.3 Marital Status		
Single	357	94.44
Married	19	5.03
Complicated	2	0.53
Total	**378**	
1.4 Educational Attainment		
Elementary Level	91	24.07
Secondary Level	132	35.92
Tertiary Level	51	13.49
Elementary Graduate	29	7.67
Secondary Graduate	47	12.43
College Graduate	26	6.88
Others, Please specify	2	0.53
Total	**378**	
1.5 Years of Community Involvement in Community Development		
below 1 year	37	9.79
1-5 years	113	29.89
6-10 years	87	23.02
11 years and above	141	37.30
Total	378	

In terms of marital status of youth-respondents' majority are Single with a frequency of 357 or 94.44.0%. On the contrary, the minority in terms of marital status is Complicated with a frequency of 2 or 0.53% out of 378 participants. This implies that most youth in Barangay Panas, Candijay are not yet in committed relationships, or are not part of a civil union. Thus, they are not involved in either any type of sexual relationship, romantic relationship, including long-term dating, engagement, or marriage.

The table also presents that the majority of youth-respondents' are in the secondary level which totaled 132 or 35.92% out of 378 respondents. On the other hand, the minority are in Vocational with the frequency of 2 or 0.53%. This implies that the youth in Barangay Panas, Candijay are more active in community involvement during their secondary years compared to the college youths.

Lastly, as to years of involvement of youth-respondents, majority are involved in community development in Barangay Panas, Candijay for 11 years or above already with the frequency of 141 or 37.3% out of 378 respondents. Meanwhile, the minority are involved below 1 year with a frequency of 37 or 9.79%. This signifies that most youth enjoy being involved in community development and tend to spend more years to connect with other communities.

The table 2 shows the different levels of youth formation in terms of *Maka-Diyos*, *Maka-Tao*, *Maka-kalikasan*, and *Makabayan*. Description and interpretation of this data follows the presentation.

Table 2. Respondents' Perception on the level of implementation of youth formation
N = 378

Statement As a Filipino, I…….	WM	DI
2.1 Maka-Diyos		
respect sacred places.	3.62	A
respect religious beliefs of others.	3.53	A
demonstrate curiosity and willingness to learn about other ways to express spiritual life.	3.14	S
engage oneself worthwhile spiritual activities.	3.07	S
go to Church on Sundays.	3.08	S
Average Weighted Mean	3.29	A
2.2 Maka-Tao		
show respect for all.	3.67	A
view mistakes as learning opportunities.	3.34	A
uphold and respect the dignity and equality of all including those with special needs.	3.34	A
volunteer to assist others in times of need.	3.17	S
accept defeat and celebrates others' success.	3.39	A
Average Weighted Mean	3.38	A
2.3 Makakalikasan		
show a caring attitude toward the environment.	3.43	A
practice waste management.	3.33	A
conserve energy and resources.	3.24	S
keep my work area in order during and after work.	3.22	S
keep one's work neat and orderly.	3.29	A
Average Weighted Mean	3.30	A
2.4 Makabansa		A
identify myself as a Filipino.	3.74	A
respect the flag and national anthem.	3.76	A
takes pride in diverse Filipino cultural expressions, practices, and traditions.	3.50	A
promotes the appreciation and enhancement of Filipino languages.	3.46	A
abide by the rules of the school, community, and country enable to develop interest and pride in being a Filipino.	3.47	A
Average Weighted Mean	3.59	A
Overall Average Weighted Mean	3.39 Highly Implemented	

Legend:

Rating Scale	Verbal Interpretation (VI)	Meaning
3.25 – 4.00	Always (A)	Highly Implemented
2.50 – 3.24	Sometimes (S)	Implemented
1.75 – 2.49	Rarely (R)	Less Implemented
1.00 – 1.74	Not at All (NA)	Not Implemented

The table shows that the category Makabansa got the highest average weighted mean of 3.59 interpreted as highly implemented, while the category with lowest average weighted mean was the Maka-Diyos with 3.29.

As to makabansa aspect, the item 2 “respect the flag and national anthem” got the highest weighted mean of 3.76; while the lowest weighted mean was item 4 “promotes the appreciation and enhancement of Filipino languages” with 3.46 or interpreted as highly implemented.

In the maka-Diyos aspect, the majority of the respondents always respect sacred places with the highest mean of 3.62. Therefore, the respondents assert that the youth respondents have become *Maka-Diyos* during their involvement in community development in Barangay Panas, Candijay. On the other hand, the indicator with the lowest mean of 3.07 states that youth *often* engage oneself in worthwhile spiritual activities.

This finding is supported by Llego (2023) who emphasized that being *maka-Diyos* means expressing one's spiritual beliefs while respecting the spiritual beliefs of others. This may mean becoming a member of any religious groups that are organized in the school, preparing a prayer well when assigned to lead, and actively participating in any religious or spiritual activities held in school. According to Cordero (2023), being *maka-Diyos* is similar to being religious as this refers to a value that firmly connotes faithful obedience to the will of God which can be found in their quality of relationship with God through active participation in various rituals, practices, and other worship activities. Batara (2015) further claimed that being *maka-Diyos* is found in their prosocial behavior which is characterized by a strong link toward helping in-group and close others.

As to Maka-Tao, the table shows that the majority of the respondents always show respect for all with the highest mean of 3.67. Therefore, the respondents assert that the youth respondents have become *Maka-Tao* during their involvement in community development in Barangay Panas, Candijay. On the other hand, the indicator with the lowest mean of 3.1states that youth *often* volunteer to assist others in times of need.

This finding is supported by Llego (2023) who claims that being makatao is being sensitive to individual, social, and cultural differences who in particular shows respect for all. This includes speaking in a clear voice when communicating, using courteous words and expressions, greets teachers/elders religiously, and listens when somebody speaks, and observes and follows rules given. In addition, Legaspi (2022) states that when a person becomes *makatao*, that person forgets the self but is now part of the community. Moreover, that entire person does will be for the good of all. Thoughts of that particular person will circle around how to work for the welfare of the community and not each individual in the community. Thus, the character and he became the community or the institution himself.

In terms of Makakalikasan, it reveals that the majority of the respondents *often* show a caring attitude toward the environment with the highest mean of 3.43. Therefore, the respondents assert that the youth respondents have become *Makakalikasan* during their involvement in community development in Barangay Panas, Candijay. In contrary, the indicator with the lowest mean of 3.22 states that youth keeps their work area in order during and after work.

Finally, the table also shows that the majority of the respondents always respect the flag and national anthem with the highest mean of 3.76. Therefore, the respondents assert that the youth respondents have become *Makabansa* during their involvement in community development in Barangay Panas, Candijay. On the other hand, the indicator with the lowest mean of 3.46 states that youth *often* promote the appreciation and enhancement of Filipino languages. The average weighted mean for this category was 3.59 or Highly Implemented youth formation.

On the other hand, the table 3 illustrates the level of youth Involvement in community development. Description and interpretation of this data follows the presentation.

Table 3. Respondents’ Perception on the Level of Involvement of the Youth in Community Development
N = 378

Statement The youth is…….	WM	DI
1. informed by the community development program aspects.	3.17	A
2. consulted about the situation and realities of the program.	2.95	A
3. engaged in identifying problems and needs of your community.	2.93	A
4. engaged in assessing aspects of the project before its implementation.	2.88	A
5. actively involved in the planning and designing of the program.	2.87	A

6. is involved in revisions, agreements, and other issues related to the program.	2.78	A
7. able to determine and solve problem.	2.99	A
8. able to identify the roles in the problem.	2.99	A
9. had control and influence over the allocation resources used in the problem.	2.84	A
10. supported the activities implemented in the community.	3.17	A
Average Weighted Mean	2.96	Involved

Legend:

Rating Scale	Verbal Interpretation (VI)	Meaning
3.25 – 4.00	Strongly Agree (SA)	Highly Involved
2.50 – 3.24	Agree (A)	Involved
1.75 – 2.49	Disagree (DA)	Less Involved
1.00 – 1.74	Strongly Disagree (SD)	Not Involved

The table shows that item number 10 supported the activities implemented in the community" with the highest mean of 3.17 or Agree, while the lowest rank was item number 6 "involved in revisions, agreements, and other issues related to the program" with a weighted mean of 2.78 or agree. The average weighted mean was 2.98 and interpreted as Involved. Therefore, the respondents assert that the youth respondents have become involved in community development in Barangay Panas, Candijay. On the other hand, the indicator with the lowest mean of 2.78 states that youth are often involved in revisions, agreements, and other issues related to the program.

Table 4 shows that the majority of the respondents are always proud of being the way they are with the highest mean of 3.59. Therefore, the respondents assert that the youth respondents have become confident during their involvement in community development in Barangay Panas, Candijay. On the other hand, the indicator with the lowest mean of 2.35 states that youth are sometimes disappointed with themselves.

Table 4. Respondents' Perception on the Youths' Level of Psychosocial Traits
N = 378

Statement	WM	DI
In my involvement in the community, I..		
4.1 Confidence		
am satisfied with myself.	2.35	R
like the way I lead my life.	3.19	S
am happy with myself.	3.54	A
like the kind of person I am.	3.41	A
am proud being the way I am.	3.59	A
would keep my freedom.	3.39	A
Average Weighted Mean	3.25	A
4.2 Competence		
feel that I am just as smart as others my age.	2.74	S
find it easy to make friends.	3.22	S
do very well at sports.	2.84	S
feel that I am ready the job or tasks.	2.82	S
keep myself at a high level of competition.	2.79	S
Average Weighted Mean	2.88	S
4.3 Compassion		
feel sorry for other people when they are having problems.	3.31	A
want to help someone being taken advantage of others.	3.21	S
comfort to good people when bad things happen to them.	3.30	A
treat someone fairly and rightfully.	3.31	A
share to other people what I have.	3.28	A
happy seeing someone happy.	3.44	A
understand other person's personality.	3.36	A
care about other people's feelings.	3.34	A
am good at making and keeping friends.	3.39	A
respect the values and beliefs of other people with different races or cultures.	3.59	A
Average Weighted Mean	3.35	A
4.4 Character		
love doing things so people in the future can have better.	3.29	A
always contribute to my community and society.	3.10	S
attain to my neighbors who are in trouble and need help.	3.09	S
had to choose between helping to raise money for a neighborhood project and enjoying my free time.	2.96	S

speak up for equality. Everyone should have the same rights and opportunities.	3.21	S
do what I believe is right, even my friends make fun of me.	3.00	S
stand up for what I believe, even if it's unpopular.	3.17	S
tell the truth, even when it's not easy.	3.14	S
accept responsibility for my actions when I make a mistake or get in trouble.	3.22	S
do my best, even when I have a job I don't like.	3.12	S
Average Weighted Mean	3.13	S
Overall Average Weighted Mean	3.15	Good

Rating Scale	Verbal Interpretation (VI)	Meaning
3.25 – 4.00	Always (A)	Very Good
2.50 – 3.24	Sometimes (S)	Good
1.75 – 2.49	Rarely (R)	Fair
1.00 – 1.74	Not at All (NA)	Poor

Confidence is also a big factor in keeping learners engaged with their education and the world around them. We know that by increasing confidence, you're allowing the learner to believe they have the potential to achieve and reduce their fear of failing. This motivates them to attend school or college regularly, have better focus during classes, and complete coursework and exams to the best of their ability. Studies have shown that learners with higher confidence are more willing to learn, challenge themselves, and have better resilience in the face of difficult transitions like changing schools. In fact, confidence has been quoted as the number one predictor of academic achievement (Gill, R., 2021).

In terms of competence, it shows that the majority of the respondents often find it easy to make friends with the highest mean of 3.22. Therefore, the respondents assert that the youth respondents have become competent during their involvement in community development in Barangay Panas, Candijay. In contrary, the indicator with the lowest mean of 2.74 states that youth often feel that they are just as smart as others my age.

According to Dillard, Newman and Kim (2019), to enhance long-term development, Positive Youth Development (PYD) approach objectives simultaneously promote protective factors, develop internal and external assets, and mitigate risk factors. The integration of a PYD approach within the BARJ model addresses the need to enhance youth competency development through PYD indicators inherent to many community-based programs.

When it comes to compassion, it reveals that the majority of the respondents always respect the values and beliefs of other people with different races or cultures with the highest mean of 3.59.

The results indicated that compassion and self-compassion remained largely unchanged across all age groups, and adult athletes had lower observable levels of compassion and self-compassion when referenced back to the normative data. In general, levels of self-reported compassion and self-compassion motivation and action were similar across all age groups within the academy (Beavan, Speilmann, Johns, Doty & Mayer, 2022).

Therefore, the respondents assert that the youth respondents have become compassionate during their involvement in community development in Barangay Panas, Candijay. On the other hand, the indicator with the lowest mean of 3.21 states that youth often want to help someone being taken advantage of by others.

Lastly, in terms of character, the table shows that the majority of the respondents always love doing things so people in the future can have better the highest mean of 3.29. Therefore, the respondents assert that the youth respondents have acquired good character during their involvement in community development in Barangay Panas, Candijay. On the other hand, the indicator with the lowest mean of 2.96 states that youth often had to choose between helping to raise money for a neighbourhood project and enjoying my free time.

Based on the findings of the study of Zarrette, Lui, Vandell and Simpkins (2021) suggest that the greater the intensity, duration, and breadth of participation, the more favorable youth character outcomes. For moral character, the type and quality of the activity setting appear to be particularly important for supporting development.

On the Overall, findings suggest that moral and civic character development ought to be considered and intentionally nurtured within activities as two separate, yet complimentary dimensions of interpersonal character.

Table 5. Multiple Regression Analysis to Determine Significant Predictors of Learners' Psychosocial Traits
N = 378

Model	Beta	t	p-value	R-square	Interpretation
Youth Formation	0.199	5.364	<.001	0.639	Significant
Youth Involvement	0.672	18.083	<.001		Significant

*Dependent Variable: Psychosocial Effect

Multiple regressions were conducted to determine the effect of youth formation and involvement on the psychosocial traits of learners. The analysis in Table 6 revealed that both the youth formation, (Beta=0.199, t(376)=5.364, p<.001) and youth involvement, (Beta=0.672, t(376)=18.083, p<.001) are significant predictors of learners' psychosocial effects. The correlation coefficient value denotes that youth formation and involvement are significantly related to the psychosocial effects of learners. The positive correlation coefficient indicates that as the level of youth formation and involvement increases, the level of psychosocial effects of learners also increases.

Furthermore, the r-square of 0.639 signifies that almost 64% of the variability of the learners' psychosocial effects can be explained by the youth formation and involvement and more than 36% can be explained by other variables. This implies that the psychosocial effects of learners greatly influenced by the youth formation and involvement.

Psychosocial theories focus on the nature of self-understanding, social relationships, and the mental processes that support connections between the person and his/her social world. Psychosocial theories address patterned changes in ego development, including self-understanding, identity formation, social relationships, and worldview across the life span. According to the psychosocial theories, development is a product of the ongoing interactions between individuals and their social environments. Societies, with their structures, laws, roles, rituals, and sanctions, are organized to guide individual growth toward a particular ideal of mature adulthood (Barbara, M. ,et al, 2020).

Working together with other members of their communities, including children, adults and elders, youth engagement in community development offers ways youth can change the world few other activities can. Community development happens when people take action to solve common problems affecting the places they live, work and play every day.

Community members, neighbourhood activities, elected officials, professionals and youth can all work together to build better communities for everyone affected. Increasingly, when foundations, government programs, and innovative community organizations want creative solutions to difficult funding issues, they turn to young people for solutions. Oftentimes, youth are connected to their communities in more authentic and unhindered ways than adults that can help communities by better understood.

Engaging young people throughout society can move children and youth to feel more ownership in their lives and demonstrate a more giving role in the community. You can connect anything you are passionate about to changing the world in positive, powerful ways.

CONCLUSIONS

Through the findings, following conclusions are drawn:

The youth respondents obtain a very high level of involvement in community development where the youth formation is actively implemented in the community. These involvements influence psychosocial traits within the society. Moreover, the correlation coefficient value denotes that youth formation and involvement are attributed to the increase of psychosocial traits of the youth. Therefore, as the evident of the youth formation can lead to the boost of psychosocial traits.

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YOUTH FORMATION AND INVOLVEMENT IN COMMUNITY DEVELOPMENT IN RELATION TO THEIR PATRIOTISM

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ABSTRACT

The study aimed to determine the effect of youth formation and involvement in community development on patriotism in Barangay Panas Candijay, Bohol during the year 2023. The findings of this study served as the basis for proposing an action program. The study employed a descriptive-correlational methodology with the aid of modified questionnaire adapted from Sugut, et al., (2018), and Bloomquist (2010) to generate data on youth involvement, and level of patriotism respectively. The study was conducted in Barangay Panas which is composed of 293 males and 280 females. All gathered data was subjected to statistical treatment. The results revealed that both the youth formation and youth involvement are significant predictors of learners' patriotism. Moreover, there was a positive coefficient of correlation infers that youth formation was significantly related to the learners' patriotism. Further, the r-square of 0.409 deduces that almost 41% of the variability of the learners' patriotism can be explained by the youth formation and more than 59% can be explained by other variables. This denotes that youth formation greatly influenced the learners' patriotism. This study concludes that the youth respondents have a very high level of patriotism during their involvement in community development as the youth formation was highly implemented in the community. Moreover, the correlation coefficient value denotes that youth formation and involvement are attributed to the increase of patriotism of the youth. Therefore, as the level of youth formation increases, the level of patriotism also increases.

Keywords: Barangay, Community Development, Involvement, Patriotism, Youth Formation

INTRODUCTION

Youth participation in the country is recognized by the government in the National Commission of Youth and the Philippines Youth Development PLAN of 2017-2022. Undoubtedly, meaningful youth engagement empowers young people with enhanced skills, knowledge, self-esteem, connectedness, belonging and a sense of value and purpose (Bill & Melinda, 2022).

Meanwhile, youth involvement in community development is vital to improve one's patriotism that contributes not just a single community but improves society as a whole. Through their active participation, youth gradually learns crucial life-skills, various knowledge on human rights, citizenship, and even promoting positive civic action (United Nations, 2011).

However, despite the motivations and influences, there are some factors that prevent participation of youths in community development which decreases the level of the interrelation to behavioral and social factors (Aghakhani, 2015). In particular, there is a need for a sense of belonging, communication, and making them the target of the program since it is palpable that the majority of youth these days do not engage in anything of no benefit to them (Ben, 2021).

Apparently, the absence of youth's active participation leads them to becoming 'social outsiders'. They could be oblivious to societal activities which may result in negative effects on their patriotism (Poole, 2018). Eventually, they will find it difficult to understand society itself. To be exact, they can neither truly understand it nor grasp its presence. That leaves to the fact that the absence of their participation in community would lead them fully inactive and uncommitted citizens (Poole, 2018).

In the Philippines, there are 30 million young people who are 10-24 and account for 28% of the Philippine Population (UNFPA). This clearly reveals an opportunity to strengthen the capacities of youth to become the next generation

Several youths tend to spend some of their time contributing to particular communities wherein their involvement positively affects their psychosocial and patriotism. According to Ehnorh (2019), youth is best defined as a person's period of transition where a person transforms from a dependent to an independent adult. In addition, youth are considered as a backbone of a society and hence they determine the future of a certain society. It is further explained that youth of all of the other age groups, the kids, teenagers, middle aged, and senior citizens rely on them and expect a lot from them (Shoaib, 2020).

Moreover, youth is believed to be an essential stage in both current and the future society. Conclusively, due to the growing dependence on youth, they play the role with the knowledge that their families, communities, and the country lies in their hands (Shoaib, 2020).

Based on the United Nation, the youth comprises 16 percent of the world's population. In particular, 28 percent of the Philippine citizenry is composed of the youth sector or those belonging to the age range of 10 to 24 years (United Nations, 2022). Thus, it is safe to assume that the youth has a great importance when it comes to shaping and improving the society because they have the capability to determine the future, not only of a single community or nation but they can also shape the future of the globe (United Nations, 2022).

According to Htet (2022), social factors and political and legal factors are two of three factors that have a solid influence on community participation. Moreover, youth's involvement in their communities was believed to be mainly supported by their families' and encouraged by their peers. Basically, several ways in which a young person's social group can encourage him or her to participate in community development projects, such as volunteering, giving back to the community, and joining student unions.

Mohamed, et al., (2019), stated that the development of the country will inevitably involve the development of the current younger generation since they will soon take leadership of the country. It is further noted that the youth should not be ignored in the country's development scheme plan. Mohamed, et al., (2019) suggests that there is a need to focus on the youth, particularly on the development of their patriotic spirit.

Evidently, youth involvement in community planning, decision-making, and action were not observed in the past. However, in today's generation with their community's support, it is noticeable that youth are becoming involved in community development (GGAI, 2022). Additionally, the collaboration among youth benefits the community, particularly the non-profit organizations as they volunteer to programs and nongovernmental organizations. Conversely, these involvements help youths become empathetic citizens who could potentially continue similar work when they become adults. Additionally, youths who give back to their communities develop leadership as a result of psychosocial and patriotism through youth involvement in community development (GGAI, 2022).

Patriotism refers to the feeling of attachment and love to one's country which further includes devotion and huge support for the nation. Therefore, a patriot is a person that keeps their respect for their country and is dedicated towards an integral part of the nation's growth. Moreover, patriotism does not directly mean that the person supports a particular party or learning. Thus, it means respecting and abiding the system of governance (Prasanna, 2020).

Based on the findings of the study of Zarrette, Lui, Vandell and Simpkins (2021) suggest that the greater the intensity, duration, and breadth of participation, the more favorable youth character outcomes. For moral character, the type and quality of the activity setting appear to be particularly important for supporting development. Overall, findings suggest that moral and civic character development ought to be considered and intentionally nurtured within activities as two separate, yet complimentary dimensions of interpersonal character.

It is highlighted by Paricio, et al., (2020) that the youth's involvement comes into contact with like-minded peers and positive adult role models other than their parents. In the same manner, interacting and cooperating with other adults and peers in community organizations uplifts the youth to see other viewpoints of the world. Paricio, et al., (2020) further discussed that the various activities in the community enhance youth's self-confidence and self-esteem. Therefore, this kind of involvement could educate the youth on how to contend with various challenges, communicate with different people and improve their skills with the help of a supportive environment.

It was discovered by Khin (2017) that youth participation in community development is perceived as an effective method for promoting young people's active engagement with social services. However in rural communities like Cambodia, young people's participation is most associated with labor contribution, which apparently lacks the core components of participation such as decisions, choices, and management. This is one of the reasons why youth do not like being involved in community development.

The role of youth engagement in positive youth development, it is found that there is a significant increase in most of the study variables such as self-esteem, self-efficacy, group identity, empathy, relational skills, assertiveness, and conflict resolution (Iwasaki, 2015). On the other hand, a study on the role of the community in development of the youth, it is concluded that the youth is actively engaging in any physical activities because of the support they get from the community in terms of their motivation, participation, and to their attitude (Aquino, et al. 2022).

Finally, based on the study of Richey (2011) about civic engagement and patriotism, it was found that constructive patriotism promotes civic participation, and that civic participation separately increases constructive patriotism. Conversely, it is further found that blind patriotism lowers civic participation, and that civic participation lowers blind feelings. The study of Richey (2011) provides a fuller picture of the relationship of patriotism with civic participation than has been provided previously in political theory or political psychology. This gives much confidence of the youth.

In the Philippines, Section 13, Article II of the 1987 Constitution recognizes the vital role of the youth in nation-building and the role of the State in inculcating patriotism and nationalism in the youth and encouraging their involvement in public and civic affairs. In line with this, President Rodrigo Roa Duterte called on Congress to pass a law which shall invigorate nationalism and patriotism among young Filipinos and further promote their role in nation-building (Cayetano, 2019).

Republic Act 10742 also known as the "Sangguniang Kabataan Reform Act of 2015" is an act establishing reforms in the Sangguniang Kabataan creating enabling mechanisms for meaningful youth participation in nation building. The State recognizes the vital role of the youth in nation-building and thus, promotes and protects their physical, moral, spiritual, intellectual and social well-being, inculcates in them patriotism, nationalism and other desirable values, and encourages their involvement in public and civic affairs. Towards this end, the State shall establish adequate, effective, responsive and enabling mechanisms and support systems that will ensure the meaningful participation of the youth in local governance and nation-building.

Statement of the Problem

The study aimed to determine the effect of youth formation and involvement in community development on their patriotism of Barangay Panas Candijay, Bohol during the year 2023. The findings of this study served as the basis for proposing an action program.

1. What is the profile of the respondents in terms of sex, age, marital status, educational attainment and number of community involvement?
2. What is the respondents' assessment on the youth formation as to maka-Diyos, makatao, maka-kalikasan and makabansa?
3. What is the respondents' level of involvement in community development?
4. What is the respondents' level of patriotism?
5. Does the youth formation and involvement influence the patriotism of the youth?

RESEARCH METHODOLOGY

Design

The study employed a descriptive-correlational methodology. Thus, this is a quantitative study. This strategy was chosen by the researchers to get numerical data to see if there was a correlation between the effects of youth involvement in patriotism in Barangay Panas. This design provided an outline of actual thoughts, emotions, and actions within a certain category of individuals. The descriptive-correlational research design was used in the study which is relevant to the study, to measure both the description and the relationship of the elements.

Environment and Participants

Panas is a barangay in the municipality of Candijay, in the province of Bohol. Its population as determined by the 2020 Census was 1,767. This represented 5.87% of the total population of Candijay. In particular, Panas is situated at approximately 9.8309, 124.5416, in the island of Bohol. Elevation at these coordinates is estimated at 16.6 meters or 54.5 feet above mean sea level.

The study was conducted in Barangay Panas which is composed of 573 youth community residents. In particular, there were 293 males and 280 females. The respondents were selected randomly per purok based on their sample size.

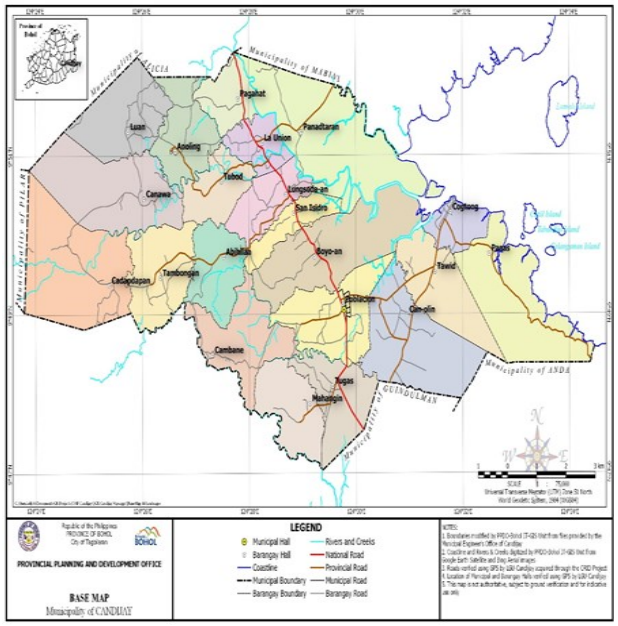

Figure 1. Map of Candijay, Bohol

Instrument

The researchers utilized a modified questionnaire adapted from different sources to conduct a survey. The questionnaire was divided into five parts, namely: part I, comprised to generate information on the demography of the respondents; part II used to collect information on the level of influence on youth involvement adapted from Sugut, et al., (2018).

Part III was to gather data on the level of community involvement adapted from Engida (2020) which consists of a 9 item test. Finally, Part V to gather data on the youth's level of patriotism which consists of an 8 item test adapted from Fried et. al, (1991).

Statistical Treatment

1. To determine the profile of the respondents, percentage was used.
2. To determine the level of influence and patriotism of youth on community involvement in community development, weighted mean was used.
3. Multiple regressions were used to determine the effect of youth formation and involvement on their patriotism.

RESULTS AND DISCUSSION

This section present the data gathered using the questionnaire. It also shows the interpretation and discussion in each data presented to identify effects of patriotism on youth formation and involvement in community development in Barangay Panas, Candijay, Bohol that will serve as the basis for proposing an enhancement program.

The table 1 presents the demographic profile of the youth-respondents in terms of sex, age, marital status, educational attainment, and length of community involvement.

Table above shows that in Barangay Panas, Candijay, the majority of the youth involved in community development are Male with a frequency of 197 or 52.12% out of the 378 youth-respondents. On the contrary, the Female has the lower frequency of 181 or 47.88%. This implies that there is a slight difference between these sexes in terms of community involvement.

The youth-respondents' age range is from 10-24. Majority of the respondents aged between 10-14 which totalled 157 or 41.53% out of 378 respondents. On the contrary, the minority aged above 24 or 2.38%. This implies that the youth respondents have not already reached adult legal capacity. Researchers assume that youth members become more inactive in community involvement as they get older.

In terms of marital status of youth-respondents' majority are Single with a frequency of 357 or 94.44.0%. On the contrary, the minority in terms of marital status is Complicated with a frequency of 2 or 0.53% out of 378 participants. This implies that most youth in Barangay Panas, Candijay are not yet in committed relationships, or are not part of a civil union. Thus, they are not involved in either any type of sexual relationship, romantic relationship, including long-term dating, engagement, or marriage.

Table 1. Demographic Profile of the Respondents
N = 378

1.1 Sex	**Frequency**	**Percentage (%)**	**Rank**
Male	197	52.12	1
Female	181	47.88	2
1.2 Age			
10-14	157	41.53	1
15-19	128	33.86	2
20-24	84	22.22	3
Above 24	9	2.38	4
1.3 Marital Status			
Single	357	94.44	1
Married	19	5.03	2
Complicated	2	0.53	3
1.4 Educational Attainment			
Elementary Level	91	24.07	2
Secondary Level	132	35.92	1
Tertiary Level	51	13.49	3
Elementary Graduate	29	7.67	5
Secondary Graduate	47	12.43	4
College Graduate	26	6.88	6
Others, Please specify	2	0.53	7
1.5 Years of Community Involvement in Community Development			
below 1 year	37	9.79	4
1-5 years	113	29.89	2
6-10 years	87	23.02	3
11 years and above	141	37.30	1

The table also presents that the majority of youth-respondents' are in the secondary level which totaled 132 or 35.92% out of 378 respondents. On the other hand, the minority are in Vocational with the frequency of 2 or 0.53%. This implies that the youth in Barangay Panas, Candijay are more active in community involvement during their secondary years compared to the college youths.

Lastly, as to years of involvement of youth-respondents, majority are involved in community development in Barangay Panas, Candijay for 11 years or above already with the frequency of 141 or 37.3% out of 378 respondents. Meanwhile, the minority are involved below 1 year with a frequency of 37 or 9.79%. This signifies that most youth enjoy being involved in community development and tend to spend more years to connect with other communities.

Table 2. Respondents' Perception on the level of implementation of youth formation
N = 378

Statement As a Filipino, I…….	WM	DI
2.1 Maka-Diyos		
respect sacred places.	3.62	A
respect religious beliefs of others.	3.53	A
demonstrate curiosity and willingness to learn about other ways to express spiritual life.	3.14	S
engage oneself worthwhile spiritual activities.	3.07	S
go to Church on Sundays.	3.08	S
Average Weighted Mean	3.29	A
2.2 Maka-Tao		
show respect for all.	3.67	A
view mistakes as learning opportunities.	3.34	A
uphold and respect the dignity and equality of all including those with special needs.	3.34	A
volunteer to assist others in times of need.	3.17	S
accept defeat and celebrates others' success.	3.39	A
Average Weighted Mean	3.38	A
2.3 Makakalikasan		
show a caring attitude toward the environment.	3.43	A
practice waste management.	3.33	A
conserve energy and resources.	3.24	S
keep my work area in order during and after work.	3.22	S
keep one's work neat and orderly.	3.29	A
Average Weighted Mean	3.30	A
2.4 Makabansa		A
identify myself as a Filipino.	3.74	A
respect the flag and national anthem.	3.76	A
takes pride in diverse Filipino cultural expressions, practices, and traditions.	3.50	A
promotes the appreciation and enhancement of Filipino languages.	3.46	A
abide by the rules of the school, community, and country enable to develop interest and pride in being a Filipino.	3.47	A
Average Weighted Mean	3.59	
Overall Average Weighted Mean	3.39 Highly Implemented	

Legend:

Rating Scale	Verbal Interpretation (VI)	Meaning
3.25 – 4.00	Always (A)	Highly Implemented
2.50 – 3.24	Sometimes (S)	Implemented
1.75 – 2.49	Rarely (R)	Less Implemented
1.00 – 1.74	Not at All (NA)	Not Implemented

The table 2 shows the different levels of youth formation in terms of Maka-Diyos, Maka-Tao, Maka-kalikasan, and Makabayan. Description and interpretation of this data follows the presentation.

The table shows that the category Makabansa got the highest average weighted mean of 3.59 interpreted as highly implemented, while the category with lowest average weighted mean was the Maka-Diyos with 3.29.

As to makabansa aspect, the item 2 "respect the flag and national anthem" got the highest weighted mean of 3.76; while the lowest weighted mean was item 4 "promotes the appreciation and enhancement of Filipino languages" with 3.46 or interpreted as highly implemented.

The Republic Act 10742 also known as the "Sangguniang Kabataan Reform Act of 2015" is an act establishing reforms in the Sangguniang Kabataan creating enabling mechanisms for meaningful youth participation in nation building. The State recognizes the vital role of the youth in nation-building and thus, promotes and protects their physical, moral, spiritual, intellectual and social well-being, inculcates in them patriotism, nationalism and other desirable values, and encourages their involvement in public and civic affairs. Towards this end, the State shall establish adequate, effective, responsive and enabling mechanisms and support systems that will ensure the meaningful participation of the youth in local governance and nation-building.

In the maka-Diyos aspect, the majority of the respondents always respect sacred places with the highest mean of 3.62. Therefore, the respondents assert that the youth respondents have become Maka-

Diyos during their involvement in community development in Barangay Panas, Candijay. On the other hand, the indicator with the lowest mean of 3.07 states that youth often engage oneself in worthwhile spiritual activities.

This finding is supported by Llego (2023) who emphasized that being maka-Diyos means expressing one's spiritual beliefs while respecting the spiritual beliefs of others. This may mean becoming a member of any religious groups that are organized in the school, preparing a prayer well when assigned to lead, and actively participating in any religious or spiritual activities held in school. According to Cordero (2023), being maka-Diyos is similar to being religious as this refers to a value that firmly connotes faithful obedience to the will of God which can be found in their quality of relationship with God through active participation in various rituals, practices, and other worship activities. Batara (2015) further claimed that being maka-Diyos is found in their prosocial behavior which is characterized by a strong link toward helping in-group and close others.

As to Maka-Tao, the table shows that the majority of the respondents always show respect for all with the highest mean of 3.67. Therefore, the respondents assert that the youth respondents have become Maka-Tao during their involvement in community development in Barangay Panas, Candijay. On the other hand, the indicator with the lowest mean of 3.1states that youth often volunteer to assist others in times of need.

This finding is supported by Llego (2023) who claims that being makatao is being sensitive to individual, social, and cultural differences who in particular shows respect for all. This includes speaking in a clear voice when communicating, using courteous words and expressions, greets teachers/elders religiously, and listens when somebody speaks, and observes and follows rules given. In addition, Legaspi (2022) states that when a person becomes makatao, that person forgets the self but is now part of the community. Moreover, that entire person does will be for the good of all. Thoughts of that particular person will circle around how to work for the welfare of the community and not each individual in the community. Thus, the character and he became the community or the institution himself.

In terms of Makakalikasan, it reveals that the majority of the respondents often show a caring attitude toward the environment with the highest mean of 3.43. Therefore, the respondents assert that the youth respondents have become Makakalikasan during their involvement in community development in Barangay Panas, Candijay. In contrary, the indicator with the lowest mean of 3.22 states that youth keeps their work area in order during and after work.

Finally, the table also shows that the majority of the respondents always respect the flag and national anthem with the highest mean of 3.76. Therefore, the respondents assert that the youth respondents have become Makabansa during their involvement in community development in Barangay Panas, Candijay. On the other hand, the indicator with the lowest mean of 3.46 states that youth often promote the appreciation and enhancement of Filipino languages. The average weighted mean for this category was 3.59 or Highly Implemented youth formation.

On the other hand, the table 3 illustrates the level of youth Involvement in community development. Description and interpretation of this data follows the presentation.

The table shows that item number 10 supported the activities implemented in the community" with the highest mean of 3.17 or Agree, while the lowest rank was item number 6 "involved in revisions, agreements, and other issues related to the program" with a weighted mean of 2.78 or agree. The average weighted mean was 2.98 and interpreted as Involved.

Therefore, the respondents assert that the youth respondents have become involved in community development in Barangay Panas, Candijay. On the other hand, the indicator with the lowest mean of 2.78 states that youth are often involved in revisions, agreements, and other issues related to the program.

In relation, the Republic Act 10742 also known as the "Sangguniang Kabataan Reform Act of 2015" is an act establishing reforms in the Sangguniang Kabataan creating enabling mechanisms for meaningful youth participation in nation building. The State recognizes the vital role of the youth in nation-building and thus, promotes and protects their physical, moral, spiritual, intellectual and social well-being, inculcates in them patriotism, nationalism and other desirable values, and encourages their involvement in public and civic affairs. Towards this end, the State shall establish adequate, effective, responsive and enabling mechanisms and support systems that will ensure the meaningful participation of the youth in local governance and nation-building.

Table 3. Respondents' Perception on the Level of Involvement of the Youth in Community Development
N = 378

Statement	WM	DI
The youth is…….		
1. informed by the community development program aspects.	3.17	A
2. consulted about the situation and realities of the program.	2.95	A
3. engaged in identifying problems and needs of your community.	2.93	A
4. engaged in assessing aspects of the project before its implementation.	2.88	A
5. actively involved in the planning and designing of the program.	2.87	A
6. is involved in revisions, agreements, and other issues related to the program.	2.78	A
7. able to determine and solve problem.	2.99	A
8. able to identify the roles in the problem.	2.99	A
9. had control and influence over the allocation resources used in the problem.	2.84	A
10. supported the activities implemented in the community.	3.17	A
Average Weighted Mean	2.96	Involved

Legend:

Rating Scale	Verbal Interpretation (VI)	Meaning
3.25 – 4.00	Strongly Agree (SA)	Highly Involved
2.50 – 3.24	Agree (A)	Involved
1.75 – 2.49	Disagree (DA)	Less Involved
1.00 – 1.74	Strongly Disagree (SD)	Not Involved

Table 4 shows that the majority of the respondents strongly agree that they have high respect for the Philippine national heroes with the highest weighted mean of 3.80. Meanwhile, the lowest weighted mean of 3.05 was statement number 13 "always present during community gatherings". The average weighted mean for this category was 3.45 and interpreted as very high. Therefore, the respondents assert that the youth respondents have a very high level of patriotism during their involvement in community development in states that youth agree they always present during community gatherings.

According to Prasanna (2020) patriotism refers to the feeling of attachment and love to one's country which further includes devotion and huge support for the nation. Therefore, a patriot is a person that keeps their respect for their country and is dedicated towards an integral part of the nation's growth. Moreover, patriotism does not directly mean that the person supports a particular party or learning. Thus, it means respecting and abiding the system of governance (Prasanna, 2020).

Table 4. Respondents' Perception on the Level of Patriotism
N = 378

Statement	WM	DI
As a Filipino, I…..		
1. have high respect for the Philippine national heroes.	3.80	SA
2. am proud being Filipino citizen.	3.71	SA
3. am honored other Filipino excelled overseas.	3.56	SA
4. have high regard on the Philippine Flag.	3.66	SA
5. sing the Philippine National hymn by heart.	3.62	SA
6. patronize the products made in the country.	3.47	SA
7. always watch movie made by Filipino directors.	3.18	A
8. know the history of the Philippines.	3.30	SA
9. happy to share the Philippines to foreigners.	3.34	SA
10. can recall Filipino cultures and traditions	3.29	SA
11. look up to our national heroes.	3.46	SA
12. have faith to elected leaders in the community.	3.27	SA
13. always present during community gatherings.	3.05	A
14. make myself available when my neighbors need my help..	3.31	SA
15. keep my faith to our Almighty God who is the source of everything.	3.67	SA
Average Weighted Mean	3.45 SA Very High	

Legend:

Rating Scale	Verbal Interpretation (VI)	Meaning
3.25 – 4.00	Always (A)	Very High
2.50 – 3.24	Sometimes (S)	High
1.75 – 2.49	Rarely (R)	Low
1.00 – 1.74	Not at All (NA)	Very Low

Typically, youth show patriotism through community service as they expose themselves to their fellow citizens in times of crisis (Amante, 2020). In the same manner, it is stated that the ability to have rights and perform duties not only for a person's good or personal interests benefit the whole society. Hence, it can be one's awareness of one's attitude to the motherland, its people, its origins and roots. Additionally, it is considered as a set of civic values and moral principles such as freedom, equality, social justice, tolerance, and pluralism (Rozhkova, 2020).

Multiple regression was conducted to determine the effect of youth formation and involvement on the learners' patriotism. The analysis in Table 7 disclosed that youth formation is a significant predictor of the learners' patriotism, (Beta=0.614, t(376)=12.922, p<.001). The positive coefficient of correlation infers that youth formation was significantly related to the youths' patriotism. The strong positive correlation suggests that as the level of youth formation increases, the level of patriotism of learners also increases.

Table 5. Multiple Regression Analysis to Determine Significant Predictors of Learners' Patriotism N = 378

Model	Beta	t	p-value	R-square	Interpretation
Youth Formation	0.614	12.922	<.001	0.409	Significant
Youth Involvement	0.044	0.927	0.354		Not Significant

*Dependent Variable: Learners' Patriotism

Moreover, the r-square of 0.409 deduces that almost 41% of the variability of the youths' patriotism can be explained by the youth formation and more than 59% can be explained by other variables. This denotes that youth formation greatly influenced the learners' patriotism.

However, youth involvement is not a significant predictor of the learners'' patriotism, (Beta= 0.044, t (376)= 0.927; p=0.354.

Patriotism among youth should be taken seriously in order to create the nation's identity as stated in "Wawasan 2020". Nowadays, youth are the main pillar and heir to the future leadership that will continue to lead the development of the country.

The problem of patriotism is of interdisciplinary character; psychological, ideological, axiological, and ethical interpretations of it dominate feeling and value, social attitude and political practice, idea and duty, the basis of national identity and the factor of social consolidation (Lubsky, 2019).

CONCLUSIONS

Through the findings, following conclusions are drawn:

The youth respondents have a very high level of patriotism during their involvement in community development as the youth formation was highly implemented in the community. Moreover, the correlation coefficient value denotes that youth formation attribute to the develop patriotism of the youth, while the involvement is not an aspect to improve patriotism. Therefore, the youth formation can influence to the progress of patriotism.

RECOMMENDATION

Based on the findings of the study, the researchers' recommendations are as follows:

1. The school and community should strengthen the implementation of local ordinance that protects the welfare of the youth and encouraging more youth to get involved in community development.
2. Parents should closely monitor the whereabouts of their children and be responsible for knowing and understanding the difficulties that are facing which positively improves their relationship with the community.
3. The youth should be engaged in the youth formation, attend trainings and open for the opportunity to improve their competence, skills, personal character and patriotism.
4. There should be further research about youth formation and community involvement and use this study as one of the basis for improvement.

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COMMUNICATIVE ABILITIES AND BUSINESS SKILLS OF SELECTED HOSPITAL EMPLOYEES IN THE FOURTH CONGRESSIONAL DISTRICT OF QUEZON

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ABSTRACT

One of the most crucial qualities a hospital staff needs to possess is a high degree of communication and business skills. This study aimed to assess the level of communicative abilities and business skills of selected hospital employees in the fourth congressional district of Quezon. The researcher determined the level of communicative abilities, in terms of active listening, communication style, persuasion, giving feedback, written communication, confidence, openness, presentations and public speaking, empathy, cross-cultural communication, digital communication, and conflict management and business skills of the selected hospital employees in terms of, understanding of economics, data analysis, financial accounting, negotiation skills, business management, leadership skills, emotional intelligence, decision-making skills, and networking. With this, the researcher used a descriptive and quantitative method among the selected hospital employees in the fourth congressional district of Quezon in which a questionnaire was utilized as the instrument for data gathering by personal and online survey. The respondents of the study were composed of 294 hospital employees, private and public, in the fourth congressional district of Quezon. With reference to the findings, the researcher concluded that the hospital employees in the fourth congressional district of Quezon have very high level of communication skills in all aspects, very high in business skills in terms of effective communication and high in all other aspects. This study also revealed that age, sex, and department assigned have no significant relationship on the level of communicative abilities and business skills of the selected hospital employees. Only the educational attainment has recorded significant on the level of communicative abilities in terms of, written and cross-cultural communication, and level of business skills in terms of data analysis, business management and networking.

Keywords: communicative abilities, business skills, hospital employees

INTRODUCTION

Communication skills enable you to provide and receive different kinds of information. Although these skills may be a regular part of the day's work schedule, they are an extraordinarily rare and helpful skill that enables communication to go on effectively and efficiently. Efforts towards achieving different personal and career goals will undoubtedly be supported by the experiences of great communicators around, as well as through an active practice of improving communications over time. Listening, talking, watching, and empathizing are some of the skills involved in communication. It's also helpful to comprehend the numerous forms of communication that occur via phone calls, in-person interactions, and digital channels like Facebook and email.

There are four main types of communication one might use daily, including verbal communication by way of a spoken language, non-verbal communicating by way of body language, facial expressions and vocalic, written communicating by way of written language, symbols and numbers, and visual communication by way of photography, art, drawings, sketches, charts, and graphs.

Communication is a fire that is burning an engine on the job. How critical communication can be for the success of an organization is hard to overestimate. Communication is a key factor for holding solid working relationships at all levels of the organization. The open communication channels help staff to trust each other and can ultimately lead to increased productivity and improved morale. If a system of open communication is in place, where employees can communicate with each other through their voices, they tend to have more positive feelings for themselves and organizations. On the other hand, it can lead to an inscrutable and discontented work force when there is a lack of communication between organizations. The success of an organization depends on effective communication.

An effective communicator is one who is actively, thoughtfully and truly listening to his or her counterpart; constantly asking questions and answering in the right way. They speak with clarity, confidence and graciousness in their interactions.

It is, on the other hand, conceivable that all professionals would be better served if they could understand basic business concepts and tools. Ensuring that every member of an enterprise is skilled with the skills needed for a smooth daily operation, such as analytical thinking, time management and efficient communications, is important to business owners in order to achieve their objectives.

If you aim to advance your career, the value of business skills cannot be overstated. In addition to hard skills (such as financial accounting and an understanding of economics), you need soft skills (such as emotional intelligence and leadership) as your organization grows.

Knowledge of key business concepts may help you to gain a better understanding of how your organization is performing and acquire the instruments necessary for launching initiatives and driving strategic decision-making, regardless of industry.

The study provided information to hospital staff members about their degree of business and communication skills. Proper knowledge of these results may help the employees have a background on how communicative abilities and business skills may impact their job performance and for them to discover possible ways to enhance their skills and ability. As for the future researchers, the result of this study will serve as a good reference of useful information.

STATEMENT OF THE PROBLEM/OBJECTIVES

This study aims to know the communicative abilities and business skills of selected hospital employees in the 4th Congressional District of Quezon, Province.

Specifically, this study envisioned to answer the following questions:

1. What is the profile of the respondents in terms of
   - 1.1 Age.
   - 1.2 Sex.
   - 1.3 Highest education attainment.
   - 1.4 Length of work experience.
   - 1.5 Nature of employment; and
   - 1.6 Department assigned/affiliate.
2. What is the level of communication ability of the respondent in terms of
   - 2.1 Active listening.
   - 2.2 Communication style.
   - 2.3 Persuasion.
   - 2.4 Giving feedback.
   - 2.5 Written.
   - 2.6 Confidence.
   - 2.7 Openness.
   - 2.8 Presentations and public speaking.
   - 2.9 Empathy.
   - 2.10 Cross-cultural communication.
   - 2.11 Digital Communication; and
   - 2.12 Conflict Management.
3. What is the level of business skills of the respondent in terms of
   - 3.1 Understanding of economics.
   - 3.2 Data analysis skills.
   - 3.3 Financial accounting skills.
   - 3.4 Negotiation skills.
   - 3.5 Business management skills.

3.6 Leadership skills.
3.7 Effective communication skills.
3.8 Emotional intelligence.
3.9 Decision-Making skills; and
3.10 Networking

4. Is there any significant difference in the level of communicative abilities of the respondents when they are group into profile?
   4.1 Age profile.
   4.2 Sex profile.
   4.3 Highest education profile.
   4.4 Length of work experience profile.
   4.5 Nature of employment profile.
   4.6 Department affiliate profile; and
   4.7 Performance evaluation profile.
5. Is there any significant difference in the level of business skills when they are grouped into profile?
   5.1 Age profile.
   5.2 Sex profile.
   5.3 Highest education profile.
   5.4 Length of work experience profile.
   5.5 Nature of employment profile.
   5.6 Department affiliate profile; and
   5.7 Performance evaluation profile.

METHODOLOGY

Research Design

In this study, both correlational and descriptive methodologies were used by the researcher. Correlation method because the communicative and business skills of the two sets of subjects will be correlated. The Descriptive Method will also be used because it is the primary aim of this study to obtain a complete overview of the characteristics of the subject from which we have been selecting hospital staff. This shall include both quantitative and qualitative methods.

Participants

The participants of this study are the employees who are currently working in selected hospitals from the Fourth Congressional District of Quezon, Province.

The respondents as to the number of hospitals are as follows: 18 employees of Alabat Island District Hospital from Alabat Island; 27 employees of Doña Marta Memorial District Hospital and 9 employees of Nuestra Señora De Los Angeles General Hospital Inc. from Atimonan; 19 employees of Calauag St. Peter General Hospital and 3 employees of Calauag Municipal Hospital from Calauag; 24 employees of Guinayangan Medicare Community Hospital from Guinayangan; 48 employees of Gumaca District Hospital, 11 employees of San Diego Hospital and 37 employees of Rakkk Prophet Medical Center Inc. from Gumaca; 21 employees of Lopez St. Jude General Hospital, 41employees of Magsaysay Memorial District Hospital and 12 employees of Holy Rosary Hospital from Lopez; and 24 employees of Maria L. Eleazar General Hospital from Tagkawayan. . A total of 294 hospital employees composed the respondents of this study.The respondents will provide various data and information in the study by validating the contents of the questionnaire only.

Data Gathering Procedure

Permission was secured from the hospital's administrators and chiefs. All questionnaires were personally delivered and administered by the researcher.

This study consists of six stages: the first stage deals with formulations of the different types of questions for the survey to the respondents, which are the employees from selected hospitals in 4th District of Quezon, Province. In the second stage, the researcher provides a survey questionnaire for evaluating the communicative abilities and business skills of the respondents. Next stage is the Validation of Questionnaires and Test. The tests and the questions will be presented to the professors. The fourth stage is the Questionnaire Method. The researcher used written and digital questionnaires in gathering Information. The researcher gave or distributed the questionnaire to the respondents online. The actual survey was conducted in the fifth stage. The last stage deals with the administration and gathering of data in the test answered by the respondents. Also includes analyzing and interpreting data.

Ethical Consideration

In this study, the researcher has a duty to those involved and associated in the conceptualization of the paper. The researcher must uphold the correct ethical standards in relation to personal data and the purposes of this paper. In consideration of human rights and the code of data protection, all personally identifiable information acquired through the survey will be kept confidential amongst researchers. The raw data files will be kept in a secure, well-organized file folder and will only be available to the researcher. The consent of the respondents and the hospital department will be requested throughout the data collection process as a sign of respect for their freedoms.

In terms of validation, in order to test the validity of the evaluation tool which will be used for this study, the researcher will seek an expert/professional to validate the questionnaires.

The researcher will consult the adviser, Dr. Maria Celerina Oreta, for any suggestions or any necessary corrections to improve the instrument further. The researcher will modify the content of the questionnaire based on the assessment and vague of difficult terminologies into simpler ones to make the survey more comprehensive for the selected respondents.

Data Analysis

The researcher will use the following to interpret the gathered data:

1. Frequency and Percentage Distribution – Frequency and percentage distribution will be used to analyze and summarize the results of responses from the survey questionnaires to describe the profile of the respondents.

Formula to use: $$P = \frac{f}{n} \times 100$$

Where:

P = Percentage
F = Frequency
N = Number of respondents

RESULTS AND DISCUSSION

This part of the study presents the results and discussion of data gathered from the survey conducted among selected hospital employees from the fourth district of Quezon. The data gathered are based on the respondents' responses in the instrument used, which is the questionnaire.

1. Personal Profile of the Respondents

Table 1 states the frequency and percentage distribution of the respondents in terms of age.

Table 1. Frequency and Percentage Distribution of the Respondents in terms of Age

Age	Frequency	Percentage (%)
18 to 25	46	16
26 to 30	74	25
31 to 35	69	23
36 to 40	25	9
41 to 45	33	11
46 to 50	18	6
51 and above	29	10
Total	294	100

As presented in Table 1, 74 out of 294 respondents or 25% at rank 1 came from age 26 to 30. On the other hand, the age ranges of 46 to 50 gained frequency counts of 18 out of 294 or 6% at last rank.

According to the study entitled "Moderating Effects of Self-Efficacy and Time Pressure on the Relationship between Employee Aging and Work Performance," age affects working capacity and task performance.

In another study, it was stated that young employees tend to easily adapt to work environment. This study has shown that older adults, working memory capacity tends to be more affected than that of younger adults.

Table 2 discusses the frequency and percentage distribution of the respondents in terms of sex.

Table 2. Frequency and Percentage Distribution of the Respondents in terms of Sex

Sex	Frequency	Percentage (%)
Male	97	33
Female	197	67
Total	**294**	**100**

It can be gleaned from the table that the respondents' sex, 197 of them or 67% at rank 1 were female whereas 97 or 33% at rank 2 were male.

According to the study entitled "A Study on Gender Differences in Workplace Communication across Organization," communication is an important aspect of human existence and it has a huge impact on the functioning of any organization.

Table 3 clearly reveals the frequency and percentage distribution of the respondents in terms of highest educational attainment.

Table 3. Frequency and Percentage Distribution of the Respondents in terms of Highest Educational Attainment

Highest Educational Attainment	Frequency	Percentage (%)
Elementary Undergraduate	1	1
Elementary Graduate	0	0
High School Undergraduate	7	2
High School Graduate	13	4
College Undergraduate	31	11
College Graduate	191	65
Vocational/TVET	35	12
With master's degree	12	4
With Doctoral Degree	4	1
Total	**294**	**100**

As presented in Table 3, 191 out of 294 respondents or 65% at rank 1 came from college graduates. On the other hand, elementary graduates gained frequency counts of 0 out of 294 at last rank.

Table 4 presents the frequency and percentage distribution of the respondents in terms of department assigned.

Table 4. Frequency and Percentage Distribution of the Respondents in terms of Department Assigned

Department Assigned	Frequency	Percentage (%)
Administrative Department	114	39
Nursing Service Department	98	33
Ancillary Department	70	24
Clinical Department	12	4
Total	**294**	**100**

It can be gleaned from the table that the respondents' department, 114 of them or 39% at rank 1 were administrative department whereas 12 or 4% at last rank was clinical department.

2. Level of Communicative Abilities of the Selected Hospital Employees in the Fourth Congressional District of Quezon

Table 5 shows the mean scores of the level of communicative abilities of the selected hospital employees in the fourth congressional district of Quezon in terms of active listening.

Table 5. Level of Communicative Abilities of the respondents in terms of Active Listening

Active Listening Indicators	Mean	Verbal Interpretation
1. I give the patients my full attention while maintaining appropriate eye contact.	4.59	Very High
2. While the patient is talking, I show them appropriate gestures or small responses (e.g., mhhmm, OK, I see, nodding or shaking head, etc.)	4.62	Very High
3. I avoid interrupting the patient and allowing them to finish speaking.	4.63	Very High
4. I used verbal affirmations like "I see", "I know", "Sure", "Thank You" or "I understand".	4.74	Very High
5. I visualize what the speaker is saying or is pertaining to.	4.71	Very High
Grand Mean:	**4.66**	**Very High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

As presented in Table 5, the hospital employee respondents were graded very high with 4.66 mean in the level of communicative abilities in terms of active listening, indicating that the employees give their full attention while maintaining appropriate eye contact, giving appropriate gestures or small responses, avoiding interruption while the patient is speaking, using verbal affirmations, and visualizing what the patient is saying or pertaining.

According to the 2016 study entitled 'Active Listening: The key to successful communication in hospital managers,' many organizations improve active listening in the managers' communication abilities because it is a critical factor in effectiveness. There is a need for the development of strategies that enhance hospital managers' knowledge in their active listening abilities.

In another study from 2012, leaders must understand the importance of speaking and listening in order to effectively lead. Leadership and listening are interrelated ideas. Great leaders acknowledge the need for development. To improve the listening experience, discussion should be encouraged as well as listening. Listening impacts leadership and leadership affects listening. Although the study sought to examine leadership in both corporate and educational settings, the business sector compromised most responses.

Table 6 Mean Scores of the Level of Communicative Abilities of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Communication Style

Table 6. Level of Communicative Abilities of the respondents in terms of Communication Style

Communication Style Indicators	Mean	Verbal Interpretation
1.I ask questions to patients whenever it is needed.	4.69	Very High
2. I observe reactions of those who are listening and talking.	4.62	Very High
3. I clearly state my opinions and feelings.	4.50	Very High
4. I respect the feelings, ideas, and needs of my patients while also asserting my opinion.	4.69	Very High
5. I am direct and honest with patients especially when it is about their health.	4.60	Very High
Grand Mean:	**4.62**	**Very High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

As discussed in Table 6, the hospital employee respondents got very high in verbal interpretation with 4.62 in mean in the level of communicative abilities in terms of communication style. Asking questions to patients whenever is needed and respecting the feelings, ideas, and needs of the patients while also asserting opinions got the highest mean score of 4.69 in indicating the communicative abilities in communication style.

In the study, 'The role of communication in enhancing work effectiveness of an organization," one of the most important instruments of leadership that a business can use to create efficient teams and attain high performance is communication style. Although management skills are of the utmost importance in a corporation, those that deal with standards of communication and a manager's understanding of how to relate to his workers are equally crucial. Being a manager entails not just controlling the company but also having team coordination, leadership, and communication skills.

The study entitled “Literature Review: Leader Communication Styles and Work Outcomes,” states that the way a leader communicates with his or her team has an impact on both the leader's and the team's productivity. The leader's communication style has a connection to the results of the leader's and the subordinates' labor.

Leader communication style, organizational commitment, intrinsic motivation, and job satisfaction are closely interrelated. Leadership is a working component of every job, and it is important for people to become as educated as possible about their own communication style. Communication styles of a leader, as evidently uncovered in this study, determine the action to be taken or how information is interpreted. It, therefore, poses a challenge for every leader to get acquainted with his or her communication styles based on the team and organization needs. Each of the communication styles is valid as a sample to be used in either leadership style a leader adopts.

Table 7 Mean Scores of the Level of Communicative Abilities of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Persuasion

Table 7. Level of Communicative Abilities of the respondents in terms of Persuasion

Persuasion Indicators	Mean	Verbal Interpretation
1. I use words that are appropriate for the patient’s situation.	4.66	Very High
2. I express my ideas with confidence in my skills and in how good I am at what I do.	4.56	Very High
3. I look for a common ground with patients to establish a common ground/bond/understanding between us.	4.53	Very High
4. I explain briefly all the information my patients need to know.	4.66	Very High
5. I speak confidently, clearly, and concisely.	4.61	Very High
Grand Mean:	**4.60**	**Very High**

Legend: “Very Low (1.00 – 1.50)”, “Low (1.51 – 2.50)”, “Moderate (2.51 – 3.50)”, “High (3.51 – 4.50)”, “Very High (4.51 – 5.00)”

As gleaned in Table 7, the hospital employee respondents are very high in communicative abilities in terms of persuasion with 4.60 grand mean indicating the use of words that are appropriate for the patient’s situation, expressing ideas with confidence in skills, looking for a common ground with patients, explaining briefly all he information the patients must know, and speaking confidently, clearly, and concisely.

International Journal of Economics, Management, Business and Social Science (2022) in “Persuasive Communication Strategy Implementation in Attracting Consumer Interest”, to keep a dominant position in the present situations, businesses must continue operating by putting a persuasive communication plan into action. Setting this plan into action will influence consumer interest in the company's goods and successful commercial partnerships. Research by Dartina (2018) concludes that persuasive communication is a communication strategy that has a dominant influence in attracting consumer interest and that there are persuasive communication techniques that are not planned but flow and are situational and conditional.

According to Irawanto, Hayati and Risal (2022), East Asian Journal of Multidisciplinary Researcher, in the study entitled “ Implications of Leadership Style and Persuasive Communication on Performance Mediated by Employee Work Motivation”, Persuasive communication should be considered to improve the performance of the personnels because in carrying out organizational and company work, they want quality employees, for that in the future it is expected to pay more attention to the quality of persuasive communication to make efforts to encourage work.

Table 8 Mean Scores of the Level of Communicative Abilities of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Giving Feedback

Table 8. Level of Communicative Abilities of the respondents in terms of Giving Feedback

Giving Feedback **Indicators**	**Mean**	**Verbal Interpretation**
1. I make sure I give concrete and specific feedback.	4.55	Very High
2. I include clear expectations for the performance.	4.51	Very High
3. I present my feedback in a positive, tactful, and non-threatening manner.	4.60	Very High
4. I ensure that the patient is receptive to feedback.	4.60	Very High
5. I make sure that I stay focused on the problem rather than the patient.	4.47	High
Grand Mean:	**4.54**	**Very High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

As seen in Table 8, the hospital employee respondents are very high in the level of communicative abilities in terms of giving feedback. The hospital employees make sure they give concrete and specific feedback, include clear expectations for the performance, present feedback in a positive, tactful, and non -threatening manner, ensure that the patient is receptive to feedback, and make sure that they stay focused on the problem rather than the patient.

On their study entitled "The effect of quick feedback on employee motivation and performance", Marthouret and Sigvardsson (2016) discussed the influence of feedback on employees' behavior, motivation, and performance, whereas all the participants in the study stated that they were influenced by quick feedback to some extent. It was also stated that when the feedback is given right away when needed has a better impact on the employees' overall behavior, motivation, and performance.

According to Jug, Jiang, and Bean (2019) on their study entitled "Giving and Receiving Feedback", the findings suggest that all feedback should address a specific behavior, be non-evaluative in nature, and be followed by confirmation of understanding and an action plan. Receiving feedback can be difficult, but it is enhanced by learning to listen and making conscious decision regarding implementing the messages heard. Giving and receiving feedback becomes easier with practice.

Table 9 Mean Scores of the Level of Communicative Abilities of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Written

Table 9. Level of Communicative Abilities of the respondents in terms of Written Communication

Written **Indicators**	**Mean**	**Verbal Interpretation**
1. I include only the correct and relevant details that patient needs for better comprehension.	4.57	Very High
2. I ensure that the composition is free from spelling and grammatical errors.	4.47	Very High
3. I ensure that the composition is clear and can be easily understood by patients.	4.62	Very High
4. I convey complex information by arranging and using simple words.	4.58	Very High
5. I state exactly what I mean rather than using vague words.	4.55	Very High
Grand Mean:	4.56	Very High

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

As gleaned in Table 9, the hospital employee respondents are very high in communicative abilities in terms of writing with 4.56 grand mean indicating the use of correct and relevant details, ensuring that the composition is free from spelling and grammatical errors, conveying complex information by arranging and using simple words, and stating exactly the facts.

Written communication is an essential part of business, and research has shown that it can have a significant impact on organizational performance. For example, a study by the University of North Carolina found that companies with strong written communication skills had higher profits and employee satisfaction than companies with poor written communication skills.

Another study, by the Society for Human Resource Management, found that 74% of employers believe that written communication skills are essential for success in the workplace. The study also found that employers are more likely to hire candidates with strong written communication skills, and that employees with strong written communication skills are more likely to be promoted and earn higher salaries.

Here are some of the specific benefits of effective written communication in business: Increased productivity and efficiency: Effective written communication can help to reduce misunderstandings and errors, which can lead to increased productivity and efficiency; Improved customer service: Effective written communication can help businesses to provide better customer service by ensuring that customer communications are clear, concise, and professional; Stronger relationships with stakeholders: Effective written communication can help businesses to build stronger relationships with their employees, customers, and other stakeholders; Enhanced brand reputation: Effective written communication can help businesses to enhance their brand reputation by creating a positive image of the company and its products or services.

Overall, the research findings on the effect of written communication in business are overwhelmingly positive. Effective written communication can lead to a number of benefits, including increased productivity, improved customer service, stronger relationships with stakeholders, and an enhanced brand reputation.

Table 10 Mean Scores of the Level of Communicative Abilities of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Confidence

Table 10. Level of Communicative Abilities of the respondents in terms of Confidence

Confidence Indicators	Mean	Verbal Interpretation
1. I speak at a steady and comprehensible pace.	4.57	Very High
2. I avoid using words that convey indecisiveness like “maybe”, “perhaps”, etc.	4.42	High
3. I maintain appropriate eye contact.	4.50	High
4. I make the patient comfortable by staying relaxed when listening.	4.64	Very High
5. I make sure to make everything clear about what I am asking towards my patient.	4.66	Very High
Grand Mean:	**4.56**	**Very High**

Legend: “Very Low (1.00 – 1.50)”, “Low (1.51 – 2.50)”, “Moderate (2.51 – 3.50)”, “High (3.51 – 4.50)”, “Very High (4.51 – 5.00)”

As seen in Table 10, the hospital employee respondents are very high in the level of communicative abilities in terms of confidence. The hospital employees speak at a steady and comprehensible pace, avoid using words that convey indecisiveness, maintain appropriate eye contact, making the patient comfortable by staying relaxed and make sure everything is clear.

Research has shown that confidence has a significant impact on communication in business settings. Confident communicators are more likely to be perceived as credible, persuasive, and competent. They are also more likely to be successful in negotiations, presentations, and other business interactions.

For example, one study found that salespeople who were more confident were more likely to close sales. Another study found that managers who were more confident were more likely to be rated as effective leaders by their employees.

Confidence is also important for building relationships with colleagues, clients, and other business partners. Confident people are more likely to be seen as approachable and likable. They are also more likely to be trusted and respected.

Here are some of the specific effects of confidence in communicating in business: Increased credibility: Confident communicators are perceived as more credible than those who are less confident. This is because people are more likely to believe someone who speaks with conviction and authority; Increased persuasiveness: Confident communicators are more persuasive than those who are less confident. This is because people are more likely to be persuaded by someone who believes in what they are saying; Increased perceived competence: Confident communicators are perceived as more competent than those who are less confident. This is because people are more likely to believe that someone who speaks with confidence knows what they are talking about; Increased success in negotiations: Confident negotiators are more likely to achieve their desired outcomes. This is because they are more likely to be assertive and to stand up for their interests; Increased success in presentations: Confident presenters are more likely to deliver effective presentations. This is because they are more likely to be clear, concise, and engaging; Increased relationship building: Confident communicators are more likely to build strong relationships with colleagues, clients, and other business partners. This is because they are more approachable, likable, and trustworthy.

Table 11 Mean Scores of the Level of Communicative Abilities of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Openness

Table 11. Level of Communicative Abilities of the respondents in terms of Openness

Openness Indicators	Mean	Verbal Interpretation
1. I am being thoughtful or reflective about what the patients encountered or tell.	4.59	Very High
2. I am enabling concerns to be raised and disclosed freely without fear.	4.51	Very High
3. I maintain a broad perspective, provide new information and reduce persistent emotional impacts to the patients.	4.54	Very High
4. I listen intently and ask question when revising.	4.53	Very High
5. I try to be direct while remaining respectful when discussing problems.	4.59	Very High
Grand Mean:	**4.55**	**Very High**

Legend: “Very Low (1.00 – 1.50)”, “Low (1.51 – 2.50)”, “Moderate (2.51 – 3.50)”, “High (3.51 – 4.50)”, “Very High (4.51 – 5.00)”

As gleaned in Table 11, the hospital employee respondents are very high in communicative abilities in terms of openness with 4.55 grand mean indicating the thoughtfulness and relativeness about what the patients encountered or tell, enabling concerns to be raised and disclosed freely without fear, maintaining of broad perspective, provide new information and reduce persistent emotional impacts to the patients, listening intently and asking question, and trying to be direct while remaining respectful when discussing problems.

Research findings have shown that openness in communicating in business has several positive effects, including: Increased trust and collaboration. When employees feel comfortable communicating openly with each other, they are more likely to trust and collaborate with each other. This can lead to a more productive and innovative work environment; Improved decision-making. Open communication allows for a wider range of perspectives to be considered when making decisions. This can lead to better decision-making and problem-solving; Reduced conflict. Open communication can help to reduce conflict by allowing people to share their concerns and disagreements in a constructive way; Increased employee satisfaction. Employees who feel comfortable communicating openly are more likely to be satisfied with their jobs. This can lead to higher employee retention and productivity.

Table 12 Mean Scores of the Level of Communicative Abilities of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Presentations and Public Speaking

Table 12. Level of Communicative Abilities of the respondents in terms of Presentations and Public Speaking

Presentations and Public Speaking Indicators	Mean	Verbal Interpretation
1. I am providing information in an individualized way.	4.53	Very High
2. I am responding to patient and family emotions with empathic statements.	4.55	Very High
3. I am recognizing emotional cues that patients commonly give in discussion.	4.49	High
4. I am making relevant presentations and examples for every patient’s situation.	4.53	Very High
5. I am stating facts and educational information regarding different patient situations.	4.54	Very High
Grand Mean:	**4.53**	**Very High**

Legend: “Very Low (1.00 – 1.50)”, “Low (1.51 – 2.50)”, “Moderate (2.51 – 3.50)”, “High (3.51 – 4.50)”, “Very High (4.51 – 5.00)”

As seen in Table 12, the hospital employee respondents are very high in the level of communicative abilities in terms of presentation and public speaking. The hospital employees provide information in an individualized way, responding to patient and family emotions with emphatic statements, recognizing emotional cues, making relevant presentations and examples, and state facts and educational information regarding different patient situations.

Research has shown that presentations and public speaking can have a significant impact on communication in business. For example, a study by the Carnegie Foundation for the Advancement of Teaching found that 15% of a person's financial success is due to their technical knowledge, while 85% is due to their communication skills.

Another study, by the University of California, Berkeley, found that people who are good at public speaking are more likely to be promoted and earn higher salaries.

Here are some specific ways in which presentations and public speaking can improve communication in business: Presentations can help to build relationships and trust. When you give a presentation, you are sharing your knowledge and expertise with others. This can help to build rapport and trust with your audience; Presentations can help to persuade and influence others. When you give a presentation, you are trying to convince your audience to accept your point of view or take a certain action. Effective presentations can be very persuasive and can help you to achieve your goals; Presentations can help to inform and educate others. Presentations can be used to share information about new products, services, or ideas. They can also be used to educate others about complex topics; Presentations can help to motivate and inspire others. When you give a passionate and inspiring presentation, you can motivate your audience to act and achieve their goals.

Overall, research has shown that presentations and public speaking can be very effective tools for communicating in business. When used effectively, presentations can help to build relationships, persuade, and influence others, inform and educate others, and motivate and inspire others.

Table 13 Mean Scores of the Level of Communicative Abilities of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Empathy

Table 13. Level of Communicative Abilities of the respondents in terms of Empathy

Empathy Indicators	Mean	Verbal Interpretation
1. I acknowledge the challenge and its impact on patients and their family.	4.56	Very High
2. I repeat what patients say to confirm understanding.	4.58	Very High
3. I am focusing on the patient's point of view.	4.54	Very High
4. I assure patients that I understand their situation and I am very willing to help.	4.63	Very High
5. I acknowledge my patient's fear and give statements that would lift their moods positively.	4.57	Very High
Grand Mean:	**4.57**	**Very High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

As gleaned in Table 13, the hospital employee respondents are very high in communicative abilities in terms of empathy with 4.57 grand mean indicating the acknowledgement on the challenge and its impact on patients and their family, repeating what patients say to confirm understanding, focusing on the patient's point of view, assuring patients of understanding with the situation and that is willing to help and acknowledge patient's fear and give statements that would lift their moods positively.

Empathy is the ability to understand and share the feelings of another person. It is a critical skill for effective communication in all aspects of life, but it is especially important in business.

Research has shown that empathy has a number of positive effects on business communication, including: Improved relationships: Empathy can help to build stronger relationships with customers, colleagues, and managers. When people feel understood and cared for, they are more likely to trust and cooperate with others; Increased sales: Empathy can help salespeople to better understand the needs of their customers and to close more deals. When salespeople are able to empathize with their customers, they are better able to tailor their sales pitch and address the customer's concerns; Improved customer service: Empathy can help customer service representatives to better understand and resolve customer problems. When customer service representatives are able to empathize with customers, they are more likely to provide helpful and compassionate service; Increased employee engagement: Empathy can help to create a more positive and productive work environment. When employees feel that their managers and colleagues care about them and their well-being, they are more likely to be engaged and motivated in their work.

Here are some specific examples of research findings on the effect of empathy in communicating in business: A study by the University of California, Berkeley found that customers who felt understood by salespeople were more likely to make a purchase; A study by the University of Pennsylvania found that customer service representatives who were trained in empathy were able to resolve customer problems more quickly and efficiently; A study by the University of Michigan found that employees who felt that their managers cared about them were more likely to be engaged in their work and to produce higher quality work.

Overall, the research suggests that empathy is a critical skill for effective business communication. It can help to build stronger relationships, increase sales, improve customer service, and increase employee engagement.

Table 14 Mean Scores of the Level of Communicative Abilities of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Cross-Cultural Communication

Table 14. Level of Communicative Abilities of the respondents in terms of Cross-Cultural Communication

Cross-Cultural Communication Indicators	Mean	Verbal Interpretation
1. I maintain an open-minded demeanor to unfamiliar attitudes, practices, or behavior of patients.	4.57	Very High
2. I am aware that different patients have different ways and times of doing things.	4.64	Very High
3. I am responding with flexibility.	4.61	Very High
4. I am respecting opinions from different beliefs of the patients.	4.63	Very High
5. I am considering beliefs of patients and making sure it will be observed while doing procedures.	4.62	Very High
Grand Mean:	**4.61**	**Very High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

Table 15 Mean Scores of the Level of Communicative Abilities of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Digital Communication

Table 15. Level of Communicative Abilities of the respondents in terms of Digital Communication

Digital Communication Indicators	Mean	Verbal Interpretation
1. I can use digital technologies to communicate	4.38	High
2. I make sure all information of patients is encod-	4.65	Very High
3. I respect patients who are not technologically	4.70	Very High
4. I use proper and simple wordings and under-	4.69	Very High
5. I type information clearly and briefly so the	4.65	Very High
Grand Mean:	**4.61**	**Very High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

Table 16 Mean Scores of the Level of Communicative Abilities of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Conflict Management

Table 16. Level of Communicative Abilities of the respondents in terms of Conflict Management

Conflict Management Indicators	Mean	Verbal Interpretation
1. I am compromising and accommodating styles to interact better with patients	4.56	Very High
2. I stay calm while communicating.	4.62	Very High
3. I show empathy with my patient's situation.	4.65	Very High
4. I acknowledge the challenges that the patients face and their impact to their family.	4.64	Very High
5. I am assuring patients that I understand their situation and I am very willing to help.	4.66	Very High
Grand Mean:	**4.63**	**Very High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

3. Level of Business Skills of the Selected Hospital Employees in the Fourth Congressional District of Quezon

Table 17. Mean Scores of the Business Skills of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Understanding of Economics

Table 17. Business Skills of the respondents in terms of Understanding of Economics

Understanding of Economics Indicators	Mean	Verbal Interpretation
1. I have the ability to maximize the efficiency, effectiveness and value of health care delivery.	4.47	High
2. I have the ability to promote healthy lifestyles and positive health outcomes.	4.39	High
3. I have the ability to allocate health care resources, essentially trying to maximize health benefits.	4.39	High
4. I understand the different factors which converge to influence supply, demand and pricing within the hospital facility.	4.39	High
5. I promote healthy lifestyle and positive health outcomes through study of healthcare providers, hospitals and clinics.	4.45	High
Grand Mean:	**4.42**	**High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

Table 18. Mean Scores of the Business Skills of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Data Analysis Skills

Table 18. Business Skills of the respondents in terms of Data Analysis Skills

Data Analysis Skills Indicators	Mean	Verbal Interpretation
1. I have the ability to present data findings via graphics or other illustrations.	4.33	High
2. I have the ability to understand the related tools and concepts in the hospital.	4.35	High
3. I have the ability to be skillful with basic computer applications such as Microsoft.	4.46	High
4. I investigate methods of improving the provision of clinical care and enhancing disease prevention.	4.34	High
5. I measure the effectiveness of various treatment options.	4.36	High
Grand Mean:	**4.37**	**High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

Table 19 Mean Scores of the Business Skills of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Financial Accounting Skills

Table 19. Business Skills of the respondents in terms of Financial Accounting Skills

Financial Accounting Skills Indicators	Mean	Verbal Interpretation
1. I have the ability to understand the hospital's financial health any time.	4.26	High
2. I have the knowledge to prepare financial statements quickly, computing tax obligations and effectively man-	4.13	High
3. I have the knowledge to keep financial reports, balance sheets and other financial information for	4.13	High
4. I am aware that all financial transactions must be accurately recorded and reported.	4.38	High
5. I can evaluate and understand the hospital's fast performance and its current financial condition.	4.25	High
Grand Mean:	**4.23**	**High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

Table 20 Mean Scores of the Business Skills of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Negotiation Skills

Table 20. Business Skills of the respondents in terms of Negotiation Skills

Negotiation Skills Indicators	Mean	Verbal Interpretation
1. I have the ability to successfully resolve conflicts.	4.29	High
2. I have the ability of making positive deals.	4.46	High
3. I have the ability to keep patients engaged.	4.50	High
4. I can control my emotions and come along with the situations.	4.50	High
5. I am an active listener at the same time a good communicator.	4.55	Very High
Grand Mean:	**4.46**	**High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

Table 21 Mean Scores of the Business Skills of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Business Management Skills

Table 21. Business Skills of the respondents in terms of Business Management Skills

Business Management Skills Indicators	Mean	Verbal Interpretation
1. I have the ability to understand how to use the information generated by patients and processes to identify inefficiencies and other issues.	4.47	High
2. I have the ability to understand how to lead in clinical settings.	4.39	High
3. I have the ability to create and establish protocols for staff to do so.	4.40	High
4. I can influence employees with a positive workplace with equality in giving opinions.	4.49	High
5. I have a good relationship with all the employees in the hospital.	4.55	Very High
Grand Mean:	**4.46**	**High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

Table 22 Mean Scores of the Business Skills of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Leadership Skills

Table 22. Business Skills of the respondents in terms of Leadership Skills

Leadership Skills Indicators	Mean	Verbal Interpretation
1. I have the ability to address the potential for differing (and possibly incorrect) interpretations by implementing advanced statistical techniques.	4.35	High
2. I have the ability to ensure that key responsibilities are distributed fairly and according to various workers' skills and passion.	4.44	High
3. I have the ability to identify areas for improvement and make a concerted effort to grow, both personally and professionally.	4.43	High
4. I am a visionary. I see the big picture and I set ambitious goals for the hospital.	4.44	High
5. I know my employees' inner values and I act in alignment with everybody.	4.41	High
Grand Mean:	**4.41**	**High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)",
"High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

Table 23 Mean Scores of the Business Skills of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Effective Communication Skills

Table 23. Business Skills of the respondents in terms of Effective Communication Skills

Effective Communication Skills Indicators	Mean	Verbal Interpretation
1. I have the ability to take time to listen and understand the concerns of each of my patients.	4.63	Very High
2. I have the ability to establish a trusting, collaborative relationship with patients and families.	4.59	Very High
3. I have the ability to aim to always speak with clarity, accuracy and honesty.	4.61	Very High
4. When comprehending, I always include all the relevant details the patients needed and make sure all the details are correct.	4.59	Very High
5. I give the patients my full attention and looking them in the eye.	4.61	Very High
Grand Mean:	**4.61**	**Very High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)",
"High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

Table 24 Mean Scores of the Business Skills of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Emotional Intelligence

Table 24. Business Skills of the respondents in terms of Emotional Intelligence

Emotional Intelligence Indicators	Mean	Verbal Interpretation
1. I have the ability to gain the capacity to manage conflicts.	4.41	High
2. I have the ability to inspire and motivate through leadership.	4.45	High
3. I have the ability to be able to be a coach and mentor.	4.34	High
4. I let my patients know that I understand their fear and I am very willing to help them get through it.	4.52	Very High
5. I show positive energy with my patients to lift their feelings.	4.55	Very High
Grand Mean:	**4.45**	**High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)",
"High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

Table 25 Mean Scores of the Business Skills of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Decision-Making Skills

Table 25. Business Skills of the respondents in terms of Decision-Making Skills

Decision-Making Skills Indicators	Mean	Verbal Interpretation
1. I have the ability to define the problem of the patient, establish the criteria and identify the best alternatives.	4.43	High
2. I have the ability to develop and implement a plan of action.	4.43	High
3. I have the ability to evaluate and monitor the solution and feedback when necessary.	4.46	High
4. I make sure before making a decision that all employees and professionals agree with the plan.	4.46	High
5. I do research regarding the topic before making a decision.	4.44	High
Grand Mean:	**4.44**	**High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

Table 26 Mean Scores of the Business Skills of the Selected Hospital Employees in the Fourth Congressional District of Quezon in terms of Networking

Table 26. Business Skills of the respondents in terms of Networking

Networking Indicators	Mean	Verbal Interpretation
1. I have the ability to allow the trading of ideas and information from trusted peers regarding patients.	4.45	High
2. I have the ability to make connections and forming relationships with other professionals in my field.	4.49	High
3. I have the ability to join professional organizations.	4.47	High
4. I exchange opinions with other employees regarding situations needed a great decision making.	4.48	High
5. I join organizational seminars and trainings.	4.50	High
Grand Mean:	**4.48**	**High**

Legend: "Very Low (1.00 – 1.50)", "Low (1.51 – 2.50)", "Moderate (2.51 – 3.50)", "High (3.51 – 4.50)", "Very High (4.51 – 5.00)"

4. Test for Significant Difference in the Level of Communicative Abilities of the Respondents when they are Grouped According to Profile

Table 27 Kruskal Wallis H-Test: Comparison in the Level of Communicative Abilities of the Respondents When They are Grouped According to Age

Table 27. Kruskal Wallis H-Test: Comparison in the Level of Communicative Abilities of the Respondents When They are Grouped According to Age

Indicators	K-statistic	p-value	Decision	Remarks
Active Listening	4.786	0.572	Accept Ho	Not Significant
Communication Style	6.990	0.322	Accept Ho	Not Significant
Persuasion	5.862	0.439	Accept Ho	Not Significant
Giving Feedback	10.659	0.099	Accept Ho	Not Significant
Written	5.598	0.470	Accept Ho	Not Significant
Confidence	2.954	0.815	Accept Ho	Not Significant
Openness	5.987	0.425	Accept Ho	Not Significant
Presentations and Public Speaking	8.416	0.209	Accept Ho	Not Significant
Empathy	14.286	0.027	Reject Ho	Significant
Cross-Cultural Communication	2.077	0.912	Accept Ho	Not Significant
Digital Communication	8.743	0.189	Accept Ho	Not Significant
Conflict Management	2.970	0.813	Accept Ho	Not Significant

Note: "If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."

Table 28 Kruskal Wallis H-Test: Comparison in the Level of Communicative Abilities of the Respondents When They are Grouped According to Sex

Table 28. Kruskal Wallis H-Test: Comparison in the Level of Communicative Abilities of the Respondents When They are Grouped According to Sex

Indicators	K-statistic	p-value	Decision	Remarks
Active Listening	1.407	0.235	Accept Ho	Not Significant
Communication Style	3.280	0.070	Accept Ho	Not Significant
Persuasion	0.439	0.508	Accept Ho	Not Significant
Giving Feedback	0.387	0.534	Accept Ho	Not Significant
Written	3.279	0.070	Accept Ho	Not Significant
Confidence	0.499	0.480	Accept Ho	Not Significant
Openness	0.668	0.414	Accept Ho	Not Significant
Presentations and Public Speaking	0.902	0.342	Accept Ho	Not Significant
Empathy	1.825	0.177	Accept Ho	Not Significant
Cross-Cultural Communication	1.925	0.165	Accept Ho	Not Significant
Digital Communication	0.305	0.581	Accept Ho	Not Significant
Conflict Management	0.786	0.375	Accept Ho	Not Significant

Note: "If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."

Table 29 Kruskal Wallis H-Test: Comparison in the Level of Communicative Abilities of the Respondents When They are Grouped According to Highest Educational Attainment

Table 29. Kruskal Wallis H-Test: Comparison in the Level of Communicative Abilities of the Respondents When They are Grouped According to Highest Educational Attainment

Indicators	K-statistic	p-value	Decision	Remarks
Active Listening	11.631	0.113	Accept Ho	Not Significant
Communication Style	6.536	0.479	Accept Ho	Not Significant
Persuasion	8.812	0.266	Accept Ho	Not Significant
Giving Feedback	6.878	0.442	Accept Ho	Not Significant
Written	14.675	0.040	Reject Ho	Significant
Confidence	10.114	0.182	Accept Ho	Not Significant
Openness	12.727	0.079	Accept Ho	Not Significant
Presentations and Public Speaking	9.109	0.245	Accept Ho	Not Significant
Empathy	9.312	0.231	Accept Ho	Not Significant
Cross-Cultural Communication	15.031	0.036	Reject Ho	Significant
Digital Communication	7.340	0.394	Accept Ho	Not Significant
Conflict Management	8.149	0.320	Accept Ho	Not Significant

Note: "If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."

Table 30 Kruskal Wallis H-Test: Comparison in the Level of Communicative Abilities of the Respondents When They are Grouped According to Department Assigned

Table 30. Kruskal Wallis H-Test: Comparison in the Level of Communicative Abilities of the Respondents When They are Grouped According to Department Assigned

Indicators	K-statistic	p-value	Decision	Remarks
Active Listening	3.371	0.338	Accept Ho	Not Significant
Communication Style	2.467	0.481	Accept Ho	Not Significant
Giving Feedback	4.749	0.191	Accept Ho	Not Significant
Written	0.681	0.878	Accept Ho	Not Significant
Confidence	1.406	0.704	Accept Ho	Not Significant
Openness	0.387	0.943	Accept Ho	Not Significant
Presentations and Public Speaking	3.576	0.311	Accept Ho	Not Significant
Empathy	1.360	0.715	Accept Ho	Not Significant
Cross-Cultural Communication	1.494	0.684	Reject Ho	Significant
Digital Communication	5.858	0.119	Accept Ho	Not Significant
Conflict Management	0.897	0.826	Accept Ho	Not Significant

Note: "If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."

5. Test for Significant Difference in the Level of Business Skills when They are Grouped According to Profile

Table 31 Kruskal Wallis H-Test: Comparison in the Level of Business Skills When They are Grouped According to Age

Table 31. Kruskal Wallis H-Test: Comparison in the Level of Business Skills When They are Grouped According to Age

Indicators	K-statistic	p-value	Decision	Remarks
Understanding of Economics	2.278	0.892	Accept Ho	Not Significant
Data Analysis Skills	8.243	0.221	Accept Ho	Not Significant
Financial Accounting Skills	6.329	0.387	Accept Ho	Not Significant
Negotiation Skills	6.510	0.369	Accept Ho	Not Significant
Business Management Skills	2.342	0.886	Accept Ho	Not Significant
Leadership Skills	5.094	0.532	Accept Ho	Not Significant
Effective Communication Skills	5.473	0.485	Accept Ho	Not Significant
Emotional Intelligence	3.616	0.728	Accept Ho	Not Significant
Decision-Making Skills	9.442	0.150	Accept Ho	Not Significant
Networking	4.044	0.671	Accept Ho	Not Significant

Note: "If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."

Table 32 Kruskal Wallis H-Test: Comparison in the Level of Business Skills When They are Grouped According to Sex

Table 32. Kruskal Wallis H-Test: Comparison in the Level of Business Skills When They are Grouped According to Sex

Indicators	K-statistic	p-value	Decision	Remarks
Understanding of Economics	3.190	0.074	Accept Ho	Not Significant
Data Analysis Skills	0.046	0.830	Accept Ho	Not Significant
Financial Accounting Skills	2.359	0.125	Accept Ho	Not Significant
Negotiation Skills	0.314	0.575	Accept Ho	Not Significant
Business Management Skills	0.034	0.853	Accept Ho	Not Significant
Leadership Skills	0.003	0.955	Accept Ho	Not Significant
Effective Communication Skills	0.264	0.608	Accept Ho	Not Significant
Emotional Intelligence	0.232	0.630	Accept Ho	Not Significant
Decision-Making Skills	0.359	0.549	Accept Ho	Not Significant
Networking	0.169	0.681	Accept Ho	Not Significant

Note: "If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."

Table 33 Kruskal Wallis H-Test: Comparison in the Level of Business Skills When They are Grouped According to Highest Educational Attainment

Table 33. Kruskal Wallis H-Test: Comparison in the Level of Business Skills When They are Grouped According to Highest Educational Attainment

Indicators	K-	p-value	Decision	Remarks
Understanding of Economics	8.831	0.265	Accept Ho	Not Significant
Data Analysis Skills	19.752	0.006	Reject Ho	Significant
Financial Accounting Skills	8.314	0.306	Accept Ho	Not Significant
Negotiation Skills	11.105	0.134	Accept Ho	Not Significant
Business Management Skills	16.547	0.021	Reject Ho	Significant
Leadership Skills	11.282	0.127	Accept Ho	Not Significant
Effective Communication Skills	13.057	0.071	Accept Ho	Not Significant
Emotional Intelligence	15.944	0.026	Reject Ho	Significant
Decision-Making Skills	12.349	0.090	Accept Ho	Not Significant
Networking	14.564	0.042	Reject Ho	Significant

Note: "If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."

Table 34 Kruskal Wallis H-Test: Comparison in the Level of Business Skills When They are Grouped According to Department Assigned

Table 34. Kruskal Wallis H-Test: Comparison in the Level of Business Skills When They are Grouped According to Department Assigned

Indicators	K-statistic	p-value	Decision	Remarks
Understanding of Economics	6.620	0.085	Accept Ho	Not Significant
Data Analysis Skills	1.923	0.589	Accept Ho	Not Significant
Financial Accounting Skills	5.497	0.139	Accept Ho	Not Significant
Negotiation Skills	5.184	0.159	Accept Ho	Not Significant
Business Management Skills	1.088	0.780	Accept Ho	Not Significant
Leadership Skills	0.794	0.851	Accept Ho	Not Significant
Effective Communication Skills	0.907	0.824	Accept Ho	Not Significant
Emotional Intelligence	2.252	0.522	Accept Ho	Not Significant
Decision-Making Skills	2.921	0.404	Accept Ho	Not Significant
Networking	1.234	0.745	Accept Ho	Not Significant

Note: "If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."

Action Plan

Goal: To enhance the communicative abilities and business skills of hospital employees.

Objectives:

- To know the current state of communicative abilities and business skills of hospital employees.
- To develop and implement a training program to address the identified needs.
- To evaluate the effectiveness of the training program.

SWOT ANALYSIS

STRENGTHS	WEAKNESSES
• Hospital employees have a high level of technical expertise. • Many hospital employees have direct contact with patients and families, which gives them an opportunity to build rapport and provide excellent customer service. • Hospitals are increasingly focused on patient satisfaction, which means that employees are motivated to develop their communication and business skills.	• Some hospital employees may not have the formal training or experience they need to develop strong communicative or business skills. • The healthcare industry is constantly changing, which can make it difficult for employees to keep up with the latest trends and best practices. • Hospital employees may be under a lot of stress, which can make it difficult for them to communicate effectively or focus on business skills.
OPPORTUNITIES	**THREATS**
• Hospitals can invest in training and development programs to help employees develop their communicative and business skills. • Hospitals can create a culture of continuous learning and improvement, which will encourage employees to develop their skills and knowledge throughout their careers. • Hospitals can partner with other organizations, such as professional associations and educational institutions, to provide employees with access to training and development resources.	• The shortage of healthcare workers could make it difficult for hospitals to recruit and retain employees with strong communicative and business skills. • The increasing complexity of the healthcare system could make it more difficult for employees to communicate effectively with patients and colleagues. • The rise of telemedicine could reduce the amount of direct contact that hospital employees have with patients, which could make it more difficult for them to develop their communicative and interpersonal skills.

Strategies

- Strengths: Leverage the strengths of hospital employees by providing them with opportunities to share their knowledge and expertise with others. For example, experienced employees could be paired with new employees to provide them with mentorship and support.
- Weaknesses: Address the weaknesses of hospital employees by investing in training and development programs. These programs should be tailored to the specific needs of the hospital and its employees.
- Opportunities: Capitalize on the opportunities available to hospital employees by partnering with other organizations to provide them with access to training and development resources. For example, hospitals could partner with professional associations to offer their members discounted rates on training programs.
- Threats: Mitigate the threats facing hospital employees by creating a culture of continuous learning and improvement. This will encourage employees to develop their skills and knowledge throughout their careers, which will help them to stay ahead of the curve and remain competitive in the job market.

By understanding the strengths, weaknesses, opportunities, and threats facing hospital employees, hospitals can develop strategies to help employees develop strong communicative and business skills. This will lead to improved patient care, increased customer satisfaction, and greater financial success for the hospital.

Goal	Objectives	Timeline	Persons involved and responsibilities	Strategies
To enhance the communicative abilities and business skills of hospital employees.	1. To assess the current state of communicative abilities and business skills of hospital employees.	Needs assessment (1 month)	Hospital human resources department: Responsible for conducting the needs assessment, developing and implementing the training program, and evaluating the effectiveness of the training program.	**Phase 1: Needs assessment.** Conduct a survey of hospital employees to assess their current level of communicative abilities and business skills. Interview hospital supervisors and managers to identify the communicative and business skills that they need their employees to develop. Analyze the survey and interview data to identify the specific areas where employees need the most training.
	2. To develop and implement a training program to address the identified needs.	Training program development (2 months) Training program implementation (3 months)	Hospital supervisors and managers: Responsible for identifying the communicative and business skills that their employees need to develop, and for providing support to employees who are participating in the training program.	**Phase 2: Training program development** Develop a training program to address the identified needs. The training program should be tailored to the specific needs of the hospital and its employees. It should also be interactive and engaging, and it should provide opportunities for employees to practice their new skills. **Phase 3: Training program implementation** Implement the training program. The training program can be implemented through a variety of methods, such as in-person workshops, online courses, or self-paced learning modules. It is important to make the training program accessible to all employees, regardless of their job title or schedule.
	3. To evaluate the effectiveness of the training program.	Training program evaluation (1 month)	Hospital employees: Responsible for participating in the training program and for applying what they learn in the training program to their jobs.	**Phase 4: Training program evaluation** Evaluate the effectiveness of the training program. This can be done through surveys, interviews, and performance reviews. The evaluation should be used to identify any areas where the training program can be improved.

By following this action plan, hospitals can help their employees develop the communicative abilities and business skills they need to be successful in their roles. This can lead to improved patient care, increased customer satisfaction, and greater financial success for the hospital.

CONCLUSIONS

Based on the results from this research study and findings, the following conclusions are derived:

1. Most of the hospital employee respondents are aged 26 to 30, female, college graduate and was assigned in the administrative department.
2. The level of communicative abilities of the respondents is very high in terms of Active Listening, Communication Style, Persuasion, Giving Feedback, Written, Confidence, Openness, Presentation and Public Speaking, Empathy, Cross-Cultural Communication, Digital Communication, and Conflict Management.
3. The level of business skills of the hospital employee respondents is very high in terms of Effective Communication Skills.
4. The level of business skills of the hospital employee respondents is high in terms of Understanding the Economics, Data Analysis Skills, Financial Accounting Skills, Negotiation Skills, Business Management Skills, Leadership Skills, Emotional Intelligence, Decision-making Skills, and Networking.
5. Age is not significant in the level of communicative abilities in terms of active listening, communication style, persuasion, giving feedback, written, confidence, openness, presentations and public speaking, cross-cultural communication, digital communication, and conflict management. But it is significant in terms of empathy.
6. In terms of sex, there is no significance in the level of communicative abilities in all aspect. And in terms of the highest educational attainment, only written and cross-cultural communication has significance in the level of communicative abilities. Lastly, the level of communicative abilities has no significance in all aspects of the assigned departments of the hospital employes.
7. In terms of level of business skills among the hospital employee, there is no significance when it comes to age, sex and department assigned. Only in the educational attainment, where data analysis, business management skills and networking have a significance in the level of business skills of the hospital employees.

RECOMMENDATIONS

Based on the findings and conclusions formulated in thi8s research study, he following recommendations are hereby proposed for consideration and actual implementation for the soonest possible time.

1. The hospital management should focus to the communicative abilities and business skills of every employee by conducting a needs assessment. They must identify the specific communicative abilities and business skills that hospital employees need to develop. This can be done through surveys, interviews, and focus groups with employees, supervisors, and patients.
2. The hospital must develop, implement, and evaluate a training program. Once the needs assessment is complete, a training program can be developed to address the identified areas of need. The training program should be tailored to the specific needs of the hospital and its employees. It should also be interactive and engaging, and it should provide opportunities for employees to practice their new skills. The training program can be implemented through a variety of methods, such as in-person workshops, online courses, or self-paced learning modules. It is important to make the training program accessible to all employees, regardless of their job title or schedule. After the training program has been implemented, it is important to evaluate its effectiveness. This can be done through surveys, interviews, and performance reviews. The evaluation should be used to identify any areas where the training program can be improved.
3. To the employees, the level of communicative abilities should be maintained and be practiced. Some specific training activities are communication skills training, where the employees would know how to communicate effectively with patients, family members, and colleagues; and customer service training, where employees will know how to provide excellent customer service to patients and their families. It can cover topics such as handling complaints, meeting patient expectations, and building rapport.

4. In terms of the level of business skills, the employees should develop it with business skills training, where employees will know the basic business skills, they need to be successful in their roles. It can cover topics such as time management, project management, and financial literacy.

5. to the future researchers, it is recommended to have a similar study relative to the communicative abilities and business skills among employees.

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DEVELOPMENT AND EVALUATION OF A HYBRID MICROCONTROLLER-BASED FISH DRYER

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ABSTRACT

This study aims to design and develop a hybrid microcontroller-based fish dryer and evaluate its efficiency. Specifically, the study presents the design parameters integrated with the device's development and discusses the procedures to be undertaken in the development phase of the solar fish dryer. The researcher used the developmental and descriptive-evaluative research design. The study took place at Surigao State College of Technology, Surigao City participated, with 20 identified respondents to evaluate the device. The DOST TAP TEEPS was used in the evaluation of the device. The developmental phase covers the technical parameters of the design, while the descriptive phase covers the perceptual assessment of the technical feasibility, economic viability, environmental soundness, political acceptability, and social acceptability (TEEPS). Experts from the college and end-users evaluated the device using the assessment protocol. This study showed that the developed hybrid fish dryer was conceptualized using design parameters such as weight in grams of the fish and drying time in hours. On the level of validity is the device in conformity to the Technology Assessment Protocol (TAP) of the DOST using TEEPS: In Technical Feasibility, the respondents rated an average score of 4.69, with an equivalent rating of High Acceptability; In Economic Viability, the respondents scored an average of 4.48 with an equal rating of High acceptability; Environmental Soundness responses are the same in all the statements, with an average score of 4.60, rated as High acceptability; Political Acceptability, the perceptions of the respondents of the device are the same in all the statements, with an average score of 4.18, rated as moderate acceptability In Social Acceptability, the respondents' perceptions are the same in all the statements, with an average score of 4.37, which was rated as High acceptability. The study concluded that the device was functional and acceptable for the operation of motion sensor detection and drying times. The device was not maintenance-free; instead, it was variable. The parts were replaceable and available in the electronic store and even online. The device was rated highly acceptable in its technical feasibility, economic viability, environmental soundness, political acceptability, and social acceptability. The device had an available user's manual readily accessible to guide the users in its operation. Based on the conclusions drawn from the study, the following recommendations are suggested. The researcher encourages to continue improving the device to compete with the ever-changing technology, use viable material that can withstand long-term use of the device, encourage all the device users to engage and learn how to use the application more accessible and meaningfully and lastly, encourage to submit as a utility model at the Intellectual Property of the Philippines office for IP registration and protection.

Keywords: Hybrid, Micro-controller, Fish Dryer, Instructional Material, Acceptability

INTRODUCTION

Drying is a basic form of food preservation that is often carried out at the farm level right after harvest, or primarily with highly perishable crops, at peak harvest time when local markets are saturated. Drying vegetables, fruits, and meat with thermal energy enables longer storage times and efficient transportation. Up to 70 percent of agricultural products spoil during the traditional process of open-air drying, especially in tropical and subtropical regions (INNOTECH, 2012).

Sun-drying, often known as the open-air technique, is a traditional method of preserving goods. In tropical and subtropical areas, sun drying is a common practice. However, depending on the climatic conditions, the slowness of the process can cause a variety of issues, including a loss of quality and a dramatic increase in the rapid growth and proliferation of microorganisms such as molds, which can produce mycotoxins, resulting in high product losses and, as a result, economic losses (Villalobos et al., 2016). Furthermore, it fails to fulfill the Good Manufacturing Practice (GMP) standard for food safety and health, particularly the disease-prone open-air drying procedure and the disturbance of flies and animal pests during storage.

The fish processing industry is critical to achieving fish self-sufficiency. Fish processing reduces wastage and extends the shelf-life of perishable fish. It also maximizes the country's dollar reserves through exportation. The Philippine fish processing industry began with traditional methods (drying, smoking, and salting) and has evolved into modern processing (canning and freezing) (Tahiluddin A.B. & Kadak A.E. 2022). The development of new fishery products and convenience items has a brighter future. Through the Bureau of Fisheries and Aquatic Resources, the government is working to improve and develop fish processing and new fishery products to raise awareness of the importance of fish in the diet and encourage the use of low-cost and secondary fish species.

Most of Jabonga's settlers, particularly those near the lake, lived by preserving dried Pijanga fish (a kind of fish in Jabonga). Because of the erratic schedule of rotating brownouts and changes in weather, Jabonga fishers find ways to dry their catch during this time. It is such a significant issue that Jabonga Lake residents must act and devise numerous solutions.

In this premise, the researcher proposed to develop a hybrid microcontroller-based fish dryer. It involved the integration of sensors for drying performance, such as temperature and humidity sensors, and other components such as heating elements, fans, and microcontrollers. When the system finished drying, the primary notification automatically turned off the heating element and other components to avoid wasting energy. It also contributed to the dryer's efficiency and effectiveness. While previous dryers performed well in drying and had a notification system for monitoring the drying process, the lack of a temperature control system and weather conditions dependency were significant factors for users. Hence, it was necessary to have a dependable and efficient hybrid microcontroller-based fish dryer for food preservation.

STATEMENT OF THE PROBLEM

The study aimed to develop a hybrid microcontroller-based fish dryer that fisherfolks along the area of Lake Mainit would utilize for producing dried Pijanga.

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

1. What design parameters can be integrated into the proposed development of the hybrid microcontroller-based fish dryer?
2. What procedures will be undertaken in the development phase of the hybrid microcontroller-based fish dryer?
3. What is the perception of the experts in the evaluation of the hybrid microcontroller-based fish dryer using the DOST Technology Assessment Protocol (TAP) in terms of:
    a. Technical Feasibility;
    b. Economic and Financial viability;
    c. Environmental Soundness;
    d. Political Acceptability; and
    e. Social Acceptability?
4. What user's operations manual can be formulated for the hybrid microcontroller-based fish dryer?

METHODOLOGY

Research Design

The researcher employed the developmental and descriptive-evaluative research design to develop and evaluate the hybrid microcontroller-based fish dryer. In the developmental phase, the researcher conducted the design parameters of the device. In the descriptive phase, a perceptual assessment of technical feasibility, economic viability, environmental soundness, and political and social acceptability was made.

The researcher focused on developing and evaluating the hybrid microcontroller-based fish dryer that was affordable and efficient for users.

The hybrid microcontroller-based fish dryer was composed of: a solar panel and 220v (AC) alternating current as sources of energy; a switch used to automatically divert energy from either the solar panel or 220v AC; a battery for energy storage; an inverter to control energy flows; a blower to blow air and heat into the flows and to measure the exact temperature needed to dry the fish; a drying chamber made of glass for the easy heating process.

Research Environment

The study was carried out in the Electrical Innovation Center of Surigao State College of Technology (Plate 1). It was a state college in the CARAGA Region, Philippines, composed of over 10,000 students. It was mandated to inculcate academic, professional, technical, vocational, and technological instruction and competencies by providing high-quality training in Education, Engineering, Computer, and Technology courses. Hence, the institution also offered graduate school programs, specifically a Master in Industrial Education major in Industrial Arts.

Research Respondents

The researcher aimed to develop a hybrid microcontroller-based fish dryer. The developed prototype was tested at Surigao State College of Technology, Surigao City, Philippines. Twenty electrical/ electronic experts were invited to evaluate the device. The study length was expected to be approximately ten months.

Research Instrument

The DOST TAP TEEPS was used in the evaluation of the device. The developmental phase covers the technical parameters of the design, while the descriptive phase covers the perceptual assessment of the technical feasibility, economic viability, environmental soundness, political acceptability, and social acceptability (TEEPS).

The questionnaire contained, (1) the profile of the respondent, (2) the level of perception as to; (a) technical feasibility and (b) economic viability, (c) environmental soundness (d) political acceptability (e) social acceptability (3) What design parameters can be integrated into the proposed development of the hybrid microcontroller-based fish dryer? (4) What procedures will be undertaken in the development phase of the hybrid microcontroller-based fish dryer?

The respondents had answered and selected their best choices as to their perception on the proposed device.

Data Analysis

Mean and Standard Deviation. Used to determine the effectiveness and acceptability of the product. Specifically, it determines the device's technical feasibility, economic viability, environmental soundness, and political and social acceptability.

RESULTS AND DISCUSSIONS

Design Parameters of the Developed Hybrid Microcontroller-based Fish Dryer

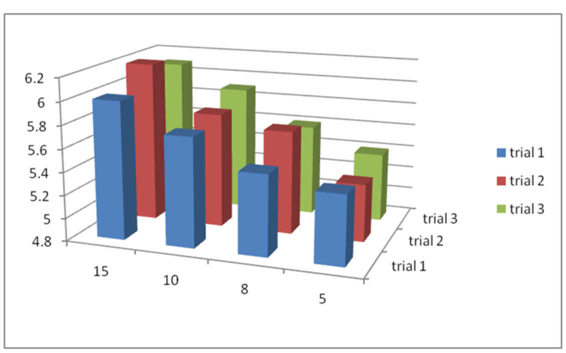

Figure 1. Weight vs. Drying Time

Figure 1 illustrated the graph of weights in grams of a sample fish against the drying time (hrs) in different trials. Three trials were observed, and all Pijanga fish were weighed the same: 15 grams with a drying time of 5.8 to 6.2 hrs, 10 grams with a drying time of 5.6 to 5.8 hrs, 8 grams with a drying time of 5.2 to 5.6 hrs, and 5 grams with a drying time of 5 to 5.2 hrs. Each fish was observed diligently to measure the exact time of the drying process. With a constant temperature of 40 degrees Celsius, the result of the drying time depended on the weight of the fish. Based on the graph above, the fish with lesser weight had a shorter time in the drying process.

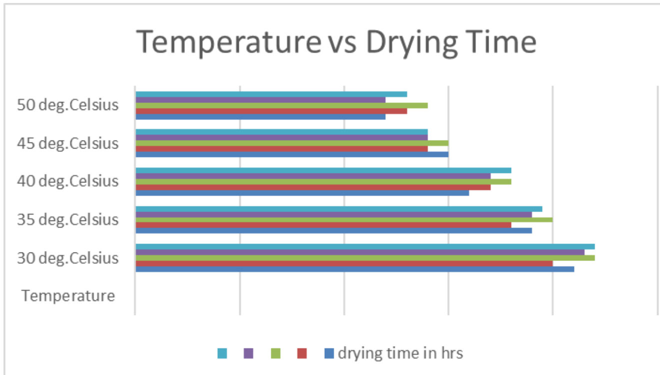

Figure 2. Temperature vs Drying Time

Figure 2 showed the suitable temperature at which the device could operate for a particular time and have its best results. It revealed an average of 40 degrees Celsius when different temperatures were observed. With a constant weight of fish in various trials, 40 degrees Celsius resulted in an acceptable moisture content of the sample dried fish. Therefore, the higher the temperature, the faster the drying process occurred.

Table 1. Level of Technical Feasibility as Evaluated by the Participants

Technical Feasibility	Average score (Total score/number of participants)	Verbal Interpretation
Safety precautions are indicated in the equipment	4.85	High Acceptability
The equipment has an operating manual	4.97	High Acceptability
Equipment has an Emergency Stop Button	4.65	High Acceptability
The equipment is installed with an automatic voltage regulator (AVR) and over current protection(circuit breaker)	4.68	High Acceptability
Electrical wiring connections are appropriately terminated	4.59	High Acceptability
The equipment parts and components are based on quality and standard.	4.44	High Acceptability
The equipment moving parts are properly assembled, well-aligned, and do not cause vibration to other parts.	4.59	High Acceptability
the thermal system is calibrated and precise	4.62	High Acceptability
The equipment provides ease of operation	4.70	High Acceptability
The components and control of the dryer are adequately labeled and accessible	4.74	High Acceptability
Availability of parts and components of the equipment are standard and readily available	4.84	High Acceptability
the equipment is safe for relocation and movement from one place to another	4.56	High Acceptability
The equipment is not bulky, the storage does not require too much space	4.75	High Acceptability
Average mean	**4.69**	**High Acceptability**

Rating Scale	Descriptive Equivalent
4.21 – 5.00	High acceptability
3.41 – 4.20	Moderate acceptability
2.61– 3.40	Undecided
1.81 – 1.60	Low acceptability
1.00 - 1.80	Not acceptable

Table 1 revealed the level of validity as evaluated by the participants in terms of *Technical Feasibility*. It can be seen in the order of the participants' responses in every statement with their corresponding average score. Statement 2 was ranked as first with an average score of 4.97 and rated as High acceptability, followed by statement 1 as second, having an average score of 4.85. Statement 11, "Availability of parts and components of the equipment are standard and readily available," ranked third with an average score of 4.84. All the statements were rated as High acceptability with an average computed mean of 4.69. Thus, the device was designed to be safe, the parts and components of the equipment are standard, the equipment provides ease of operation, and it is feasible.

Table 2. Level of Economic Viability as Evaluated by the Participants

Economic and Financial viability	Average score(total score/ number of participants)	Verbal Interpretation
The equipment does not require complex cleaning, repair, and maintenance	4.83	High Acceptability
Replacement of damaged parts is all available in the local market	4.23	High Acceptability
The equipment is low cost and affordable to end-user	4.31	High Acceptability
The equipment is cost-competitive with existing technologies and fits the need of end-user	4.54	High Acceptability
Average mean	4.48	High Acceptability

Rating Scale	Descriptive Equivalent
4.21 – 5.00	High acceptability
3.41 – 4.20	Moderate acceptability
2.61– 3.40	Undecided
1.81 – 1.60	Low acceptability
1.00 - 1.80	Not acceptable

Table 2 reflected the level of validity as evaluated by the participants in terms of *Economic and Financial Viability*. It could be seen in the order of the participants' responses in every statement with their corresponding average score. Statement 1 was ranked as first with an average score of 4.83 and was rated as High acceptability. Statement 4, with an average score of 4.54, was ranked second, and statement 3 was ranked third with an average score of 4.31. Lastly, the second statement was ranked as 4, having only an average score of 4.23 but still rated as high acceptability. In general, all the statements were rated "High acceptability," for which the computed average mean was 4.48. Hence, it affirmed that the device did not require complex cleaning, repair, and maintenance and that the parts were all available in the local market with existing technologies and fit the end user's needs.

Table 3. Level of Environmental Soundness as Evaluated by the Participants

ENVIRONMENTAL SOUNDNESS	Average score(total score/number of participants)	Verbal Interpretation
The equipment does not pose threats to the	4.58	High Acceptability
The equipment does not pose hazardous	4.63	High Acceptability
Average mean	4.60	High Acceptability

Rating Scale	Descriptive Equivalent
4.21 – 5.00	High acceptability
3.41 – 4.20	Moderate acceptability
2.61– 3.40	Undecided
1.81 – 1.60	Low acceptability
1.00 - 1.80	Not acceptable

Table 3 represented the level of validity as evaluated by the participants in terms of *Environmental Soundness*. It could be seen in the order of the participants' responses in every statement with their corresponding average score. Two statements were rated as High acceptability; these were statements 1 and 2, with corresponding average scores of 4.58 and 4.63, respectively. Statement 2 was ranked first, and statement 1 was ranked as second. With an average mean of 4.60, it resulted in a high acceptability rating. This meant that the device did not threaten the environment and had no hazardous effects on humans, animals, and plants.

Table 4. Level of Political Acceptability as Evaluated by the Participants

POLITICAL ACCEPTABILITY	Average score(total score/ number of participants)	Verbal Interpretation
The equipment matches the objectives and interests of the target end-users	4.24	High Acceptability
The equipment meets the regulatory requirement and standards for its utilization	4.12	Moderate Acceptability
Average mean	4.18	Moderate Acceptability

Rating Scale	Descriptive Equivalent
4.21 – 5.00	High acceptability
3.41 – 4.20	Moderate acceptability
2.61– 3.40	Undecided
1.81 – 1.60	Low acceptability
1.00 - 1.80	Not acceptable

Table 4 illustrated the level of validity as evaluated by the participants in terms of Political Acceptability or Project Feasibility. It could be seen in the order of the responses of the participants in every statement with their corresponding average score. Statement 1 was ranked as the first with an average score of 4.24 and was rated as High acceptability. This was followed by statement 2 as second, having an average score of 4.12 and rated as "Moderate acceptability." All the statements were rated "Moderate acceptability" with an average computed mean of 4.18. Thus, the device matched the objectives and interests of the target end-user and met the regulatory requirements and standards for its utilization.

Table 5. Level of Social Acceptability as Evaluated by the Participants

SOCIAL ACCEPTABILITY	Average score(total score/ number of participants)	Verbal Interpretation
The technology fits the local socio-cultural environment (social practices, local traditions, and culture)	4.27	High Acceptability
The equipment serves the need of the majority of those whom it seeks to benefit	4.50	High Acceptability
Both sexes can operate the equipment with ease and precision	4.34	High Acceptability
Average mean	4.37	High Acceptability

Rating Scale	Descriptive Equivalent
4.21 – 5.00	High acceptability
3.41 – 4.20	Moderate acceptability
2.61– 3.40	Undecided
1.81 – 1.60	Low acceptability
1.00 - 1.80	Not acceptable

Table 5 showed the level of validity as evaluated by the participants in terms of Socio-cultural Acceptability. It could be seen in the order of the responses of the participants in every statement with their corresponding average score. Statement 2 was ranked as first with an average score of 4.50 and was rated as "High acceptability." Statement 3 was ranked second, having an average score of 4.34. It also rated the statement as High acceptability. The first statement was last in the rank, in which the technology fits the local socio-cultural environment. This meant that both sexes could operate the equipment with ease and precision and served the needs of the majority of those whom it sought to benefit.

Table 7. Summary of Experts' Evaluation

Criteria	Average score	Verbal Interpretation
Technical Feasibility	4.69	High acceptability
Economic and Financial viability	4.48	High acceptability
Environmental Soundness	4.60	High acceptability
Political Acceptability	4.18	Moderate acceptability
Social Acceptability	4.37	High acceptability
Average mean	4.46	High acceptability

Rating Scale	Descriptive Equivalent
3.26 – 4.00	Highest quality
2.51 – 3.25	Above average quality
1.76 – 2.50	Below average quality
1.00 – 1.75	Very poor quality

Table 6 illustrates the summary of the evaluation by the participants in different criteria. The characteristics were given a positive response by the evaluators, with most of the average means falling within the 3.26 – 4.00 rating scale. It was thus rated as "Highest quality." This meant that the device was designed to be safe, moving parts were properly assembled, and it met the regulatory requirements and standards for its utilization.

RECOMMENDATION

Based on the conclusions drawn of the study, the following recommendations are suggested:

1. Encourage to continue improving the device to compete with the ever-changing technology.
2. Use viable material that can withstand long-term use of the device.
3. Encourage all the device users to engage and learn how to use the application more accessible and meaningfully.
4. Encourage to submit as a Utility model at the Intellectual Property of the Philippines office for IP registration and protection.

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DEVELOPMENT AND EVALUATION OF AN AUTOMATED FOOT SANITIZER

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ABSTRACT

The study primarily aims to design, develop, and evaluate the efficiency of a contactless foot sanitizer, a device for the prevention of the spreading of communicable diseases carried by the feet. Particularly, it is a portable dispensing device containing a liquid disinfecting agent. The device may be used by stepping on the platform and an amount of sanitizing agent will be sprayed/dispensed on the shoes/feet. The study used the development and descriptive evaluative research design. The study was conducted at Surigao State College of Technology and its evaluation was conducted among several users from Abilan, Buenavista, Agusan del Norte to assess its efficiency utilizing 10 experts from SSCT and 40 end users as respondents. The instrument used in the study was adopted from DOST TAP TEEPS protocol. The developmental phase covers the technical feasibility of the design while in the descriptive phase perceptual assessment of the performance, economic feasibility, environmental soundness, and social acceptability. The study was conducted using a descriptive developmental research method. Fifty (50) respondents participated in the study and answered the questionnaire provided. The data obtained were analyzed using perspective and inferential statistical tools. The findings of the study showed that the device is functional and acceptable to use. The device is rated with very high validity/high acceptability in terms of technical performance, economic viability, environmental soundness, and social acceptability. This means that the device was designed to be safe and pose no threat to the environment. Automated contactless foot sanitizers like this play a crucial role in the prevention of the spread of Covid-19. Providing convenient and efficient means of maintaining hand and foot hygiene is necessary especially in public places (WHO 2021). While not a sole solution, they complement other preventive measures to contribute to overall public health efforts. Base on the result of the study, it is therefore recommended to encourage the continuous improvement of the device to compete with the ever-changing technology; use viable material that can withstand long term use of the device; encourage users of the device to engage and learn on how to use the application more accessible and meaningful; and encourage to submit as Utility model at Intellectual Property of the Philippines office for IP registration and protection.

Keywords: Automated, Foot spray nozzle, Infrared transmitter, power supply, proximity sensor circuit controller, relay switch, sanitizer, water pump motor

INTRODUCTION

The World Health Organization (WHO) has made it clear that Covid-19 Pandemic and its derivatives have made people all around the world fearful for almost 3 years. Moreover, the organization stated that this pandemic is the most extreme combined health and economic crisis in the last century. Medical scholars and researchers have worked tirelessly to reduce cases, if not eliminate Covid-19 instances. To help contain or stop the virus from spreading, a variety of inventions and equipment have been developed.

It can really be exhausting to be constantly vigilant and to take precautions like using sanitizers… But sustaining these types of behaviors is a key to curbing this pandemic… (Meyer 2020) Covid-19 has taken so much toll in the community, in many homes, and in our day-to-day living. It is very unfortunate to hear news especially in social media about the untimely passing of families, relatives, friends, colleagues, and others because of Covid-19 virus. These days, we can't easily recognize if a person is a carrier of Covid-19 virus; that is why disinfectants and sanitizers are necessary. Disinfectants and sanitizers are essential preventive agents against Covid-19 (Dhama et al. 2021). Wherever people are, getting sanitized is another important thing; and an automated foot sanitizer could be a helpful device to enhance the prevention and control of the virus in offices, schools, and even at home.

The researchers designed this automated foot sanitizer to help minimize the spread of Covid-19 from a virus carrier to others. The machine can also be used in livestock/poultry farm as a preventive device for any virus/bacterial causing diseases that may be transferred from human to animal or from animals to human. The device is designed for public usage.

As of October 21, 2021, at the time of the research, according to the Department of Health-Caraga Region Office, the overall cases of Covid-19 are 47,053 with active cases of 2,389 and death toll of 1,644. With this data, the study aims to help minimize the spread of the virus with the development and evaluation of contactless foot sanitizer.

STATEMENT OF THE PROBLEM

This study aims to develop an automated foot sanitizer and evaluate its efficiency. Specifically, it sought to answer the following problems:

1. What design of foot sanitizer is to be constructed?
2. What is the difference between a contactless foot sanitizer and to commercially available foot bath in terms of:
   a. cost; and
   b. technical feature
3. What is the level of validity is the contactless foot sanitizer in conformity to the Technology Assessment Protocol (TAP) of the DOST using TEEPS (revised TEES):
   a. technical feasibility
   b. economic and financial viability
   c. environmental soundness, and
   d. social acceptability?

METHODOLOGY

Research Design

The researcher used the developmental and descriptive-evaluative research design in the development and evaluation of a contactless foot sanitizer. In the developmental phase, the researcher conducted a technical feasibility of the design while in the descriptive phase a perceptual assessment of performance, economic feasibility, environmental soundness, political acceptability, and social acceptability (TEEPS) has been made.

The researcher's focus in this study is to develop and evaluate a contactless foot sanitizer that is both affordable and efficient for the users compared to those in the market.

The design and development of the contactless foot sanitizer were done by following a budget of work. In the budget of work, the time and costs are carefully considered to meet the purpose of developing an affordable yet efficient contactless foot sanitizer.

The study will be conducted through several random users and residents of Abilan, Buenavista, Agusan del Norte as to its performance and expert evaluators from specified agencies. After the testing of the design, another phase of evaluation will be undertaken by the researcher along with some experts to gauge its acceptability. To quantify the responses of the evaluators a Likert scale will be used.

Research Environment

The researcher aims to develop a contactless foot sanitizer. The development of the study, designing and construction of the device were conducted at Abilan National High School, Abilan, Buenavista, Agusan del Norte.

For the assessment of the quality, efficiency, and acceptability of the designed device, the researcher tapped respondents, which are end users who will be randomly chosen from Butuan City, and experts from Surigao State College of Technology, Surigao City.

Research Respondents

The respondents of the study are 10 experts from Surigao State College of Technology and 10 end users from Abilan, Buenavista, Agusan del Norte.

Research Instrument

A validation was conducted after the design and construction of the device which is the contactless foot sanitizer. It was held at the Surigao State College of Technology, Surigao City. To do this, a formal letter was sent beforehand to be noted by the adviser and approved by the Dean of the Graduate Studies Department to ask for permission the conduct of the evaluation and validation process of the contactless foot sanitizer.

The personnel of the validating team were from randomly chosen users from Butuan City, and Surigao State College of Technology, Surigao City. The tool to be used in the validation will be in the form of a checklist to be categorized into the following area: technical performance, economic viability, environmental soundness, political acceptability, and socio-cultural acceptability. The validation will also be used as a tool to compare the device to the existing contactless foot sanitizer in the market.

Data Analysis

To process the level of technical feasibility of the microcontroller-based contactless foot sanitizer, it underwent a performance test with identified respondents to evaluate the sanitizer using specified criteria in the questionnaire. Means will be used to quantify the descriptive evaluation of the respondents.

The TEEPS assessment shall be used which stands for (a) technical feasibility, (b) economic/financial viability, (c) environmental soundness, (d) political acceptability, and (e) social acceptability. Technical Feasibility determines how well a technology can achieve what is designed to do and looks at its validity and reliability. The assumption is that the feasibility of the device is based on its technical performance or measured by its durability, safety, speed and accuracy, simplicity, and precision of design. Economic/Financial Viability examines the financial or economic soundness of promoting the use of technology based on a cost and return analysis. Environmental Soundness seeks to understand the ecological implication of introducing a particular recommended technology or its ecological compatibility. Political Acceptability investigates the political relevance of promoting the technology to the target end-users. Social Acceptability determines the social significance of the technology to target end-users, including its gender friendliness. (DOST TAP Manual on Technology Transfer mechanism, 2005.

RESULTS AND DISCUSSIONS

DESIGN PARAMETERS OF THE DEVELOPED CONTACTLESS FOOT SANITIZER

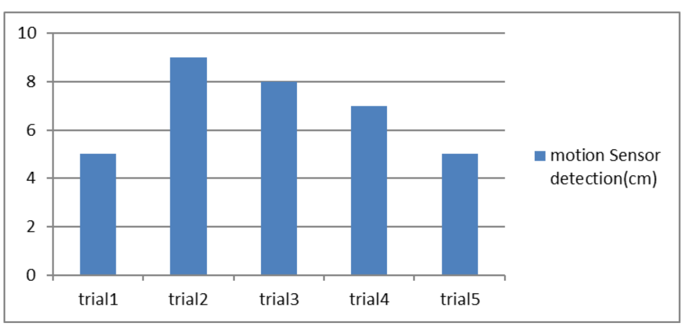

Figure 1. Motion sensor detection (cm)

The graph illustrates the motion detection of the device when used. It reveals that the detection shows an average of 6.8cm or 7cm distance of the hand to operate the sensor when the motion detector senses from the different trials made.

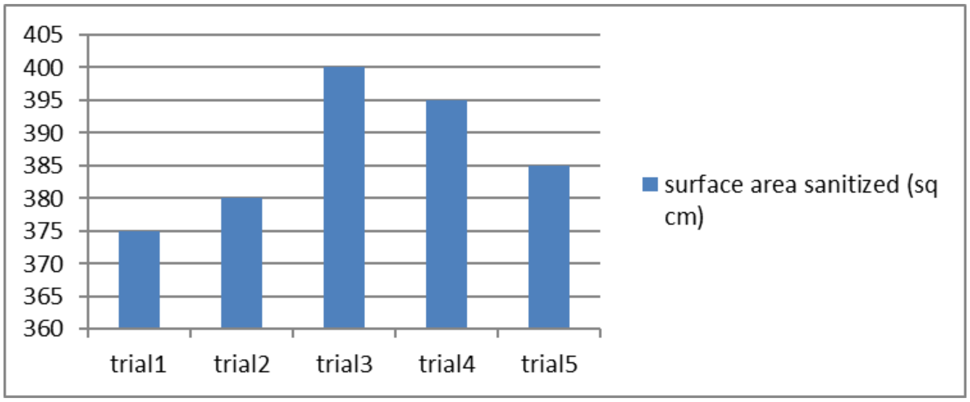

Figure 2. The surface area sanitized (sq cm)

COMPARISON OF THE DEVELOPED CONTACTLESS FOOT SANITIZER TO EXISTING DESIGN AND COMMERCIALLY AVAILABLE FOOT SANITIZER

Comparison in Terms of Cost

From the table shown below, it appears that the developed contactless sanitizer is the cheapest among the two samples. It implies that only 3.51% of the highest amount (P316,033.00) of the two samples was spent on the developed foot sanitizer. This is due to the market value of some of the components used in the design which is low cost and only a few components were used in the design foot sanitizer.

Table 1. Cost Comparison of Foot Sanitizer

Model	Cost
1. Developed Contactless Foot Sanitizer	P 9,687.60
2. Exiting Commercial Foot sanitizer (Smartstep	P 316,033.00
3. Exiting Commercially Foot sanitizer (Footwear	P 100,882.60

Comparison of Foot sanitizer in Terms of Technical Features

Table 2 presents the technical features of the developed Contactless Foot sanitizer and the two samples (A and B,). The developed contactless sanitizer is small in terms of height, width, and length as compared to the existing model. it implies that it is more portable than the other two A and B.

Table 2.Comparison of Technical features of the developed contactless foot sanitizer

Items	Technological Performance	Average score (total score/number of participants)	Verbal Interpretation
1.	The device safety operation	3.90	Highest quality
2.	The device simplicity	3.85	Highest quality
3.	The device portability	3.80	Highest quality
	Average mean	3.85	Highest quality

Level of validity of the contactless foot sanitizer in conformity to the Technology Assessment Protocol (TAP) of the DOST using TEEPS:

Table 3. Level of validity as evaluated by the participants in terms of Technological Performance.

Technical Features	Model		
	Developed Contact-less Foot sanitizer	A	B
Users per minute	3 - 6	3 - 6	15 - 25
Foot sanitizer height	10 inches	40 inches	42 inches
Foot sanitizer width	21 inches	15 inches	30 inches
Foot sanitizer length	15 inches	23 inches	29 inches
Maximum number of Users	1	1	1
Voltage	230 VAC/12VDC	230 VAC/12VDC	230 VAC/12VDC
Power	65watts	None	None
Maximum Flow	4.0L/Min	None	None
Material of construction	Metal	Plastic	Plastic
Portability	AC/DC power use/ Portable	AC Power Use/ Portable	AC Power Use/ Portable

Rating Scale	Descriptive Equivalent
3.26 – 4.00	Highest quality
2.51 – 3.25	Above average quality
1.76 – 2.50	Below average quality
1.00 – 1.75	Very poor quality

The table shows the level of validity as evaluated by the participants in terms of Technological Performance. It can be seen the order of the response of the participants in every statement with their corresponding average score. Statement 1 was rank as the first with the average score of 3.90 and rated as Highest quality. Statement 2 was rank as second having an average score of 3.85 then followed by statement 3 as the last in ranking with an average score of 3.80. also, rated the statements as Highest quality.

Table 4. Level of validity as evaluated by the participants in terms of Coverage Maintenance.

Items	Coverage Maintenance.	Average score(total score/ number of participants)	Verbal Interpretation
1.	The device is designed to be safe and ecologically sound	4.00	Highest quality
2.	The device energy and materials used are conserved	3.85	Highest quality
3.	The device promotes compliance of safety protocols	3.80	Highest quality
	Average mean	3.88	Highest quality

Rating Scale	Descriptive Equivalent
3.26 – 4.00	Highest quality
2.51 – 3.25	Above average quality
1.76 – 2.50	Below average quality
1.00 – 1.75	Very poor quality

The table illustrates the performance evaluation by the participants in terms of Coverage Maintenance. The order of the responses of the participants in every statement with their corresponding average score. Statement 1 was ranked as the first with an average score of 4.00 and rated as Highest quality. Followed by statement 2 as second having an average score of 3.85 followed by statement 3 as the last in ranking with an average score of 3.80, all the statement were rated Highest quality with an average computed mean of 3.88. Thus, the device was designed to be safe and ecologically sound.

Table 5. Level of validity as evaluated by the participants in terms of Economic Viability.

Items	Economic Viability	Average score(total score/number of participants)	Verbal Interpretation
1.	The device does not require complex cleaning, repair, and maintenance	3.70	Highest quality
2.	The device replacement of damaged parts is accessible in the market	3.75	Highest quality
3.	The device is low-cost and affordable	3.80	Highest quality
4.	The device is cost competitive with existing technologies and fits the need of end user	3.85	Highest quality
	Average mean	3.78	Highest quality

Rating Scale	Descriptive Equivalent
3.26 – 4.00	Highest quality
2.51 – 3.25	Above average quality
1.76 – 2.50	Below average quality
1.00 – 1.75	Very poor quality

The table reveals the level of validity as evaluated by the participants in terms of Economic Viability. The order of the responses of the participants in every statement with their corresponding average score. The four statements were rated as Highest quality, these are statements 1, 2, 3, and 4 with a corresponding average score of 3.70, 3.75, 3.80 and 3.85 respectively. Statement 4 was rank as first followed by statement 3, then statement 2, then the first statement as the last in ranking of which still rated as Highest quality. This means that the device is low-cost and affordable and cost competitive with existing technologies and fits the need of end user.

Table 6. Level of validity as evaluated by the participants in terms of Coverage Maintenance.

Items	***Coverage Maintenance.***	**Average score(total score/number of participants)**	**Verbal Interpretation**
1.	*The device is designed to be safe and ecologically sound*	4.00	Highest quality
2.	*The device energy and materials used are conserved*	3.85	Highest quality
3.	*The device promotes compliance of safety protocols*	3.80	Highest quality
	Average mean	**3.88**	**Highest quality**

Rating Scale	Descriptive Equivalent
3.26 – 4.00	Highest quality
2.51 – 3.25	Above average quality
1.76 – 2.50	Below average quality
1.00 – 1.75	Very poor quality

The table illustrates the performance evaluation by the participants in terms of Coverage Maintenance. It can be seen the order of the responses of the participants in every statement with their corresponding average score. Statement 1 was ranked as the first with an average score of 4.00 and rated as Highest quality. Followed by statement 2 as second having an average score of 3.85 followed by statement 3 as the last in ranking with an average score of 3.80, all the statements were rated Highest quality with an average computed mean of 3.88. Thus, the device was designed to be safe and ecologically sound.

Table 7. Level of validity as evaluated by the participants in terms of Economic Viability

Items	***Economic Viability***	**Average score (total score/number of participants)**	**Verbal Interpretation**
1.	*The device does not require complex cleaning, repair, and maintenance*	3.70	Highest quality
2.	*The device replacement of damage parts are all accessible in the market*	3.75	Highest quality
3.	*The device is low-cost and affordable*	3.80	Highest quality
4.	*The device is cost competitive with existing technologies and fits the need of end user*	3.85	Highest quality
	Average mean	**3.78**	**Highest quality**

The table reveals the level of validity as evaluated by the participants in terms of Economic Viability. The order of the responses of the participants in every statement with their corresponding average score. The four statements were rated as Highest quality, these are statements 1, 2, 3, and 4 with corresponding average scores of 3.70, 3.75, 3.80, and 3.85 respectively. Statement 4 was ranked first followed by statement 3, then statement 2, then the first statement as the last in ranking which is still rated as Highest quality. This means that the device is low-cost, affordable, and cost-competitive with existing technologies and fits the needs of the end user.

Table 8. Level of validity as evaluated by the participants in terms of Health and Environmental Soundness

Items	***Health and Environmental Soundness***	Average score (total score/ number of participants)	Verbal Interpretation
1.	*The device does not pose threat to the environment*	3.90	Highest quality
2.	*The device does not pose hazardous effect to human, animals, and plants*	3.75	Highest quality
	Average mean	3.83	Highest quality

Rating Scale	Descriptive Equivalent
3.26 – 4.00	Highest quality
2.51 – 3.25	Above average quality
1.76 – 2.50	Below average quality
1.00 – 1.75	Very poor quality

The table represents the level of validity as evaluated by the participants in terms of Health and Environmental Soundness. It can be seen the order of the response of the participants in every statement with their corresponding average score. There are two statement which are rated as Highest quality, these are the statement 1, and 2 with corresponding average score of 3.90, and 3.75 respectively. Statement 1 was rank as first and the statement 2 was rank as second. Having an average mean of 3.83, resulted to a rating of Highest quality. This means that the device does not pose threat to the environment and no hazardous effect to human, animals, and plants.

Table 9. Level of validity as evaluated by the participants in terms of Socio-cultural Acceptability.

Items	***Socio-cultural Acceptability***	Average score (total score/ number of participants)	Verbal Interpretation
1.	*The device fits the local, socio-cultural environment (social practices, local tradition mores and culture)*	3.75	Highest quality
2.	*The device serves the need of majority of those whom it seeks to benefits*	3.85	Highest quality
	Average mean	3.80	Highest quality

Rating Scale	Descriptive Equivalent
3.26 – 4.00	Highest quality
2.51 – 3.25	Above average quality
1.76 – 2.50	Below average quality
1.00 – 1.75	Very poor quality

The table shows the level of validity as evaluated by the participants in terms of Socio-cultural Acceptability. The order of the responses of the participants in every statement with their corresponding average score. Statement 2 was rank as the first with the average score of 3.85 and rated as Highest quality. Statement 1 was rank as second having an average score of 3.75, also, rated the statement as Highest quality. This means that the device serves the need of majority of those whom it seeks to benefits.

Table 10. Level of validity as evaluated by the participants in terms of Political Acceptability.

Items	***Political Acceptability***	Average score(total score/ number of participants)	Verbal Interpretation
1.	*The device matches the objectives and interests of the target end user*	3.80	Highest quality
2.	*The device meets the regulatory requirements and standards for its utilization*	3.75	Highest quality
	Average mean	3.78	Highest quality

Rating Scale	Descriptive Equivalent
3.26 – 4.00	Highest quality
2.51 – 3.25	Above average quality
1.76 – 2.50	Below average quality
1.00 – 1.75	Very poor quality

The table reveals the level of validity as evaluated by the participants in terms of Political Acceptability. It can be seen the order of the response of the participants in every statement with their corresponding average score. The Political Acceptability was given a positive response by the evaluators having most of the average score falls within the range of 3.26 – 4.00 rating scale, and so rated this as Highest quality. This means that the device matches the objectives and interest of the target end user and meets the regulatory requirements and standards for its utilization.

Table 11. Summary of the evaluation of the participants' different characteristics

Characteristics	Average score	Verbal Interpretation
Technological Performance	3.85	Highest quality
Coverage Maintenance.	3.88	Highest quality
Economic Viability	3.78	Highest quality
Health and Environmental Soundness	3.83	Highest quality
Socio-cultural Acceptability	3.80	Highest quality
Political Acceptability	3.78	Highest quality
Average mean	**3.82**	**Highest quality**

The table illustrates the Summary of the evaluation of the participant's different characteristics. The characteristics was given a positive response by the evaluators having most of the average mean falls within the range of 3.26 – 4.00 rating scale, and so rated this as "Highest quality". This means that the device was designed to be safe and pose no threat to the environment.

CONCLUSION

Automated sanitizers such as this automated contactless foot sanitizer play a crucial role in the prevention of the spread of Covid-19. Providing convenient and efficient means of maintaining hand and foot hygiene is necessary especially in public places (WHO 2021). While not a sole solution, they complement other preventive measures to contribute to overall public health efforts. Proper use, combined with vaccination and adherence to recommended safety protocols, enhances the effectiveness of controlling the transmission of the virus.

RECOMMENDATION

1. Encourage to continue improving the device to compete with the ever-changing technology.
2. Use viable material that can withstand long-term use of the device.
3. Encourage all the users of the device to engage and learn how to make the application more accessible and meaningful.
4. Encourage to submit as a Utility model at the Intellectual Property of the Philippines office for IP registration and protection.

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EFFECTIVE MANAGEMENT OF LOCAL GOVERNMENT UNITS FOSTERED SOUVENIR SHOP

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ABSTRACT

The Local Government Units (LGU) Fostered Souvenir Shop in the chosen area was the focus of the study. The study identified marketing strategies for souvenir shops, assessed their financial performance, examined personnel management, and determined marketing strategies and their sustainability. After gathering data, tabulation of result then made to determine the study's outcomes. The study used descriptive research methods and made use of information and a revised standard questionnaire from the Association Management, Consulting and Evaluation Service (AMCE), which administered from Local Government units, assisted Souvenir Shop for their Marketing Strategies, Personnel Management, and Financial Performance. According to the study, each souvenir shop offers goods or services that fulfill the needs of their clients; the organization introduced new or considerably modernized goods before its rivals; in terms of product differentiation, the quality of the goods and services matches the quality of its customers.

Keywords: Strategic Management, Marketing Strategies, Financial Performance, Fostered, Income, Personnel Management

INTRODUCTION

Effective management involves establishing the organization's goals, creating plans and policies to help attain those goals, and assigning resources to carry out the plans. It also gives the business broad direction. To support strategic decision making in the context of complex environments and competitive dynamics, researchers and experienced executives have developed a number of approaches and frameworks (Porter, Michael, 2017). Models often include feedback to track execution and offer direction for future planning since effective management. Top management companies must formulate and carry out their primary objectives and goals after evaluating their resources and the internal and external contexts in which they compete. Effective management strategy is identifying the fundamental long-term objectives of an organization, adopting the appropriate courses of action, and allocating the resources required to achieve these objectives. Establishing direction, concentrating effort, defining or clarifying the organization, and offering consistency or guidance in relation to the environment are all goals of management strategies. (A.M. McGahan, 2015)

Strategic thinking and strategic planning are related ideas in strategic management. The analytical process of strategic planning refers to formalizing the process of producing data and analyzing it as input for strategic thinking, which synthesizes the data to produce a strategy. Strategic management commonly described as consisting of two main processes: strategy formulation and strategy implementation. Even though they explained in order, the two processes' practices are iterative, and each one feeds into the other, (Porter, Michael, 2016).

Creating a strategy entails first assessing the organization's operating environment and then deciding on a number of tactical choices regarding the organization's competitive posture. A set of objectives and metrics for the organization to follow complete the formulation process. Environmental analysis encompasses the external environment that is remote, which comprises the political, economic, social, technological, legal, and environmental landscape. Conversely, industry environmental scanning considers factors like rival organizations' competitive behavior, buyers' and suppliers' bargaining power, threats from new entrants, and buyers' ability to substitute products (Porter, 2014).

Stone and Hunter (2014) Implementation, or making choices concerning how the organization's people, systems, and processes will mobilize and align in support of the goals, is the second essential phase in excellent management. Various organizational components impacted by implementation, such as resource allocation according to product or service, area, or tracking methods, leadership structures, communication, and incentives. Operations management is a term used to describe the day-to-day administration of a firm. It can also refer to various titles for specific departments or roles, such as marketing management or logistics management, which take over after strategic management decisions implemented.

The concept of souvenir authenticity (Littrell et al., 2013) refers to how tourists evaluate the authenticity of arts and crafts by using factors such product originality and cultural and historical integrity. Beauty, artisanship, the relationship between the artist and the product, witnessing the artisan at work, the practical use of the craft, cost, value in scarcity, and authenticity confirmed by a label or certificate are all-important factors. Commodification of mementos: considered as tangible goods for exchange in the tourism industry (Swanson and Timothy, 2012). They went through supply chains from their point of manufacturing and packing, transportation and distribution, to their final point of sale, where tourists eventually devoured them. They also created, sold, and consumed. Design production, gender, and economic development (Hume, 2009): emphasize how men and women have historically produced handicrafts and souvenirs, and how this industry has the potential to for business, socially, and psychologically empower women. Cultural property rights (Gutentag, 2016): moral dilemmas relating to non-native producers and intermediaries replicating and selling indigenous artwork, crafts, and symbols.

When Hu and Yu (2017) explored the rationale behind tourists' purchase and craft selection behavior, they also discovered travelers' interests. Their study shows that tourists have multiple factors when choosing crafts, such as high caliber of workmanship, sensual appreciation, cultural connection, and portability. The consumers of handcrafted mementos are diverse, according to these writers' findings as well. They distinguish three main market segments, each of which needs to effectively attracted by a different marketing strategy.

Many like to bring a souvenir of their trip home with them, something that serves as a visual representation of their travel destinations and allows them to reflect on their wonderful vacation experiences. Not to mention that having such a keepsake on display around the house might create interesting conversations with visitors. Ultimately, purchasing mementos is an integral aspect of the enjoyable vacation experience. Additionally, tourists frequently bring back a ton of new items and gifts for their friends, family, and coworkers. It is a pleasant method for them to let them know that they have been considering them while they have been away on vacation. Some of us find it impossible to avoid entering a gift shop.

The Local Government Code of 1991 (LGC), also known as Republic Act No. 7160, requires local government units (LGUs) to establish a functional mechanism and organizational structure that is dynamic, efficient, and accountable in order to meet the service requirements and priority needs of their communities. This is one of the main tenets of decentralization. The Souvenir Shop showcases primarily locally produced cuisine, wine, handicrafts, chips, and other treats.

Research has shown that countries of origin of visitors affect their travel and shopping preferences (Witkowski and Yamamoto, 2018,) (Rosenbaum and Spears, 2015). Previous studies examining the experiences of tourists throughout their travels have found that these visitors' conditions improve. The most sought-after experience when on vacation seems to be the emotive rather than the cognitive role in consumer behavioral decision and experience, even though it may considered somewhat risky for an individual in everyday life of travel and vacation, (McIntire, 2017; Yuksel and Yuksel, 2017).

Most of the time, research on souvenir shops remains unexplored (Swanson and Horridge, 2014). Improved knowledge of purchasing habits and aesthetically beautiful stores is crucial for drawing in visitors and convincing them to remain longer (Kemperman et al., 2019). Developing marketing tactics (location, price, promotion, and product/service) that best meet the demands of travelers is essential to the effective management of souvenir shops. Traveling is an essential part of the experience, and the majority of visitors bring mementos from their trip home to cherish and remember these moments. This is the purpose of the souvenir shop may come in the form of T-shirts, authentic handcrafted goods, antiques, key chains, little replicas of famous places, or different products. Swanson and Timothy (2013) state that the annual revenue generated by tourist attractions comes from the normal operations of creating, purchasing, and selling souvenirs. Even though it's not often stated as the main reason for traveling, shopping is arguably the most popular tourist activity, and local tourist store vendors can provide you with important financial data (Kent et al., 2013).

In recent years, shopping is recognized as one of the primary tourist activities (MacCannell, 2015; Snepenger et al., 2013); it often represents the largest category of spending during travels and holidays, making up approximately one-third of total costs associated with tourism (Meng and Xu, 2018). The world has become more and more globalized and so it makes reasonable that when we purchase anything from a popular tourist destination. It is more likely created unique and with reasonable price and prominently labeled with its location. Souvenir refers to the tradition of giving gifts to loved ones after a visit. In general, a souvenir is something that been retained from a place; in particular, a souvenir is something that has been given to another individual. They were searching for mementos or souvenirs to give to relatives and family.

OBJECTIVES OF THE STUDY

As the result of the project, the Local Government Units (LGU) will be able to provide better services to the community and generate a substantial increase in revenue for the government, employment opportunities, and small and medium-sized business attraction. Access to corporate hubs and will be facilitated and the economy will flourish. Furthermore, this will help provide jobs for the local population and enable the town to develop tourist attractions. The main objectives of this study are to describe the financial performance, marketing tactics, and personnel management of the souvenir shops in Zamboanga del Norte.

The economy of the nation is heavily reliant on the food, drink, and artistic sectors. Regarded as the most important manufacturing sector, accounting for 20% of the nation's GDP and 58% of all manufacturing production (Macabasco, 2019 and Roache, 2019). From 2006 to 210, there was an average 7% yearly growth in fruit and vegetable exports (Philippine Food Processors and Exporters Organization, 2021). Preserved and prepared fruits accounted for 53% of all fruit exports, while concentrated and dried fruits made up for 47% of the demand for exported fruits. The abundance of diverse varieties of fruits and vegetables is one of the Philippine's industrial advantages. The nation came in third place and as the second-largest producer (HortiASIA, 2017).

METHODOLOGY

After gathering data, tabulation made to determine the study's results. The study utilized descriptive research methods make use of the Association Management, Consulting and Evaluation Service (AMCE) instrument for information and revised standard questionnaires to administer from Local Government units fostered Souvenir Shops for their Marketing Strategies, Personnel Management, and Financial Performance. The respondents of this study are the Heads and staff shop of souvenir after the distribution of instrument tabulation made and statistical tool a simple regression employed.

RESULT AND DISCUSSION

Table 1 : Souvenir Shop Marketing Strategies

Souvenir Shop Marketing Strategies	Souvenir Shop	Souvenir Shop	Souvenir Shop
MARKETING	**1**	**2**	**3**
Merchandise or service suitable for the current market	5	4	5
Services and products meet the needs and wants of the client	4	4	5
Product offerings that can satisfy consumer demands	3	4	4
Goods or services that are positioned correctly in the market	5	4	5
Provides sales commissions and incentives for staff and personnel in achieving business objectives.	2	5	3
MEAN	3.8	4.2	4.4

Marketing strategies for each of the Souvenir Shop shown in the table above. Considering the numbers, goods, or services that Souvenir Shop provides, good marketing that are in line with consumer tastes and have a strong market position. On the other hand, commissions and incentives to personnel and staff relatively employed. Commissions, incentives, and schemes both short- and long-term are among the financial components of employee remuneration, according to Milkovich and Newman (2010) and Pattanayak (2015). When they provided, employees are more likely to put more effort and energy into their work.

Business success greatly influenced by marketing. The success of a business greatly impacted by marketing strategy because the main goal of marketing is to make goods and services popular. Once these goods and services are popular, the business and the customer form a mutually beneficial relationship that helps the business expand and eventually succeed in its day-to-day operations, (Mac Cannel, C Jr and Gates, R (2013)

These days, companies who use marketing outperform their competitors because marketing has influenced society. Many modern business success stories may attributed to clever marketing, and past events serve as a reminder that if you do not market your business well, your competitors will. Because marketing is a flexible tool that can react quickly to changing circumstances, it is imperative that all businesses have a marketing strategy that periodically reviewed and updated. Remembering that marketing is the process by which a business meets the requirements of customers by providing goods and services at a cost that guarantees consumer loyalty and business success (Stone, Sidney Hunter (2003). Thus, in order to stay ahead of the competition and emerge victorious in the economic sector, Souvenir shop must adopt marketing strategies.

Table 2 : Souvenir Shop Innovation Management

INNOVATION	Souvenir Shop	Souvenir Shop	Souvenir Shop
	1	2	3
Business introduced a new or significantly upgraded product to the market advance of its competition.	5	3	4
The concession store launched a new or substantially enhanced product that previously offered by competitors in the industry.	3	4	4
Effectiveness of innovation in raising market competitiveness.	1	4	3
The importance of innovation in raising profit margins.	3	5	4
Innovation's importance in fostering client loyalty.	5	5	3
MEAN	3.4	4.2	3.6

The data on innovation as a marketing strategy discussed in this study using Table 2. One may see that innovation is evident at the Souvenir Shops by looking at the data in the table. A weighted mean of 3.4 or 4.2, respectively, might demonstrate this. This illustrates that innovation is possible at the Souvenir Shops, due to their belief that innovation can only improve market competitiveness through the delivery of a single product to each barangay or, as they put it, "One Town, One Product." They concurred that boosting profit margins and fostering consumer loyalty could achieved through innovation, but that raising competition levels would be difficult, since

When thinking about innovation and marketing strategy, several topics may come up. Innovation has the power to change consumers' and business people's perspectives. Customers would perceive a company that is always innovating as having an aggressive approach, which gives them a competitive edge and gives them the impression that they are superior to others. Thus, a number of scholars came to conclusion that innovation is any new practice that an organization adopts. These practices can include tools, supplies, services, projects, processes, policies, and policies (Lin 2007; Khazanchi, Lewis, and Boyer, 2017). They continued by saying that innovations are extremely important to businesses because they can lead to cost savings and new income streams from new goods and services. Extending their findings, they asserted that innovations are extremely important to businesses because they can generate new revenue through the development of new goods or services, reduce expenses, or raise the standard of current operations. Because of this, souvenir shop used innovation and engaged in it as they saw it as a useful instrument for maintaining and growing their business. Extending their conclusion, they claimed that innovations are extremely important to businesses because they can generate new revenue through the development of new goods or services, reduce expenses, or raise the caliber of current operations.

Souvenir Shop applied innovation because they believed it to be an effective, (Del Barco, Mandalit, 2008)

Table 3: Souvenir Shop Differentiation Management

DIFFERENTIATION	Souvenir Shop 1	Souvenir Shop 2	Souvenir Shop 3
Quality of goods and services matches client satisfaction	5	5	5
Goods and services cover organizational costs	5	5	4
Product and service alignment with corporate goals	3	5	5
Effectiveness and efficiency of the differentiation approach	3	5	4
Use of differentiation strategy in the market: relevance	2	4	5
MEAN	3.6	4.8	4.6

The Souvenir Shops distinctive marketing strategy shown in Table 3. Observing the figures indicates that there is a lack of commonality in their product differentiation. The weighted means of 3.6 and 4.8, which characterized as "sometimes" and "often," respectively, further support this. The research demonstrated that the Souvenir Shops days are stark realities and that difference is actually a strategy. Differentiation between products and services can occur at different levels and in various ways. The most crucial factor to take into account, nevertheless, is that this differentiation in products and services should be in line with the organization's vision and goal and should, in two words, increase or broaden the organization's market reach. Product differentiation, as a marketing tactic, enables the company or group to inform its clients about the manner in which differentiation marketing strategy shown in Table 3. Product differentiation is an advertising technique, which allows an organization or association to explain to its target audience how its offerings differ from those of competitors and why they are above them. Product differentiation is an advertising technique that enables a business or category to demonstrate to its clientele how their goods and services differ from those of their competitors and why they are superior.

Differentiation can occur along products and services in souvenir shops. Every barangay or location has a unique specialty that may provide to travelers. While some souvenirs establishments offer food, others sell plush brooms, bamboo, baskets, items and sculptures made by local artists, as well as other recently created goods. Souvenir shops aim to set themselves apart in terms of process, promotion, and customer service as well. Being distinct from possible competition in the market is the goal of the differentiation strategy. The starting point for differentiating the goods or services must be valuable and depend on durable competencies that are challenging competition to replicate or match. This is the key to the strategy's success.

Table 4: Souvenir Shop Top and Personnel Management

TOP MANAGEMENT	Souvenir Shop 1	Souvenir Shop 2	Souvenir Shop 3
Executives with experience establishing strategies.	5	4	4
Upper management with experience implementing strategies.	3	4	4
The top management gets ready through succession planning.	2	4	3
Organization possible risks as well as opportunities recognized by top management.	4	4	4
Top management uses product innovation to address market demands.	4	5	4
MEAN	3.6	4.2	3.8
PERSONNEL MANAGEMENT	Souvenir Shop **1**	Souvenir Shop **2**	Souvenir Shop **3**
I have access to sufficient resources to perform my duties.	7.67	9.00	8.00
I feel that the environment at work is friendly.	9.33	8.67	7.67
I have enough freedom to carry out my duties effectively.	7.33	9.33	8.67
I am aware of what is required of me at work.	7.67	9.33	8.67
Over the past week, I have commended for my excellent work.	9.33	9.67	7.67
My superior, to whom I report, seems to be interested in getting to know me as a person.	8.67	9.33	7.67
My supervisor supports my growth	9.67	9.67	8.67
My opinion appears to matter at work.	9.00	9.33	7.00
My supervisor has spoken with me regarding my development over the past three months.	9.00	9.00	8.33
My company's mission gives me the impression that my work matters.	9.67	9.33	8.67
My colleagues are dedicated to producing high-quality work.	9.33	8.33	7.67

At work, I have the best friend, respectively.	7.00	8.33	9.00
This year, I had the chance to develop professionally at work.	8.67	10.00	8.33
The top talent in my field is eager to work for my company.	8.00	9.67	8.00
I receive updates on the happenings inside my organization.	8.33	9.67	8.33
Our supervisor takes us to seminars and training sessions to expand our expertise.	7.67	7.33	8.00
Our superiors give us benefits like health, life, and other insurances.	9.67	9.33	8.33
I am happy with the advantages I got.	8.33	9.33	9.00
We have access to seminars and trainings for our personal development.	6.67	9.00	8.00
Working at the Souvenir Shop brings me joy.	8.67	9.00	7.33

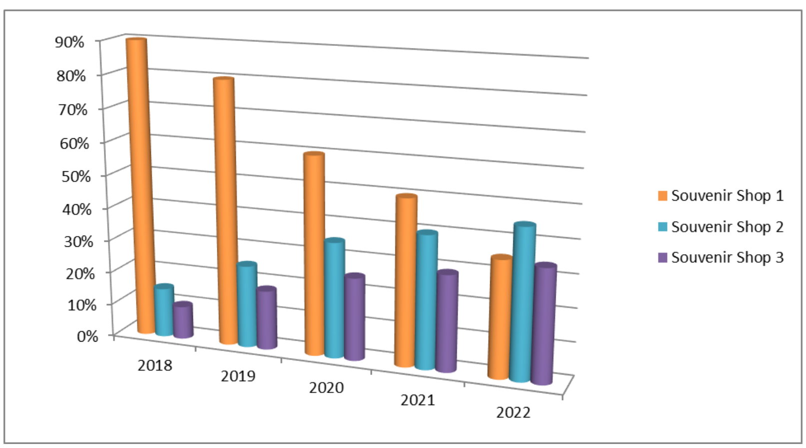
Top management displayed good professionalism as Table 4 presented. Observing what is happening additionally explores the notion that upper management carries out their duties and that the results are apparent to their staff. Effective strategy formulation and implementation, threat and opportunity identification, organizational needs response, and goal accomplishment are all included in the strategies.

These assertions supported by the means of 3.6 and 4.2, respectively, which demonstrate that the management team consistently employs sound strategy to guide the company's operations toward the achievement of its goals. This appears takes place in the organizations as, evidenced by years in operation and the expansion that the souvenirs center has experienced. These companies should not have been able to exist for more than a few years if the top executives had not appropriate measures. These companies ought to have slowed down since it will eventually force them to close.

Observing the management team and their inventiveness reveals that they are very knowledgeable about both the tasks and the best ways to complete them. Developing a strategy is a challenging aspect of assessing an organization since it takes broad topics and breaks them down into specifics so that the many goals may connected to the overall corporate aims. In addition to the fact that it is their responsibility, top management's strategizing can be difficult and time-consuming due to the amount of information required. Nevertheless, the top management of the souvenir shop under investigation has demonstrated that they are deserving of this status by pioneering the operation of the souvenir shop, (Gutentag, Daniel A. (2009)

The data collected under the personal (employee) assessment shown in table 5. The results in the table show how much consideration the Souvenir Shops put into the wellbeing of its employees. The respective means of 8.67 and 9.00 serve to concretize this claim.

Figure 1 Souvenir Shop Financial Performance



The souvenirs shop under investigation's increased revenue illustrated in Figure 1 above. The graph indicates that, in comparison to souvenirs shop 1, souvenir shop 2 has a stronger marketing plan, innovative and distinctive offerings, top management, and personnel evaluation. Showed in the graph showing souvenirs shop elevation above. Souvenirs shop furthermore, as table presented from the presentation, souvenirs shop revenue growth is declining between 2018 and 2012, in contrast to other souvenirs shop who has growing revenue, which initially started at 10% but gradually increased. Taking a broad view, it is impossible to conclude that best souvenir shop best practices represented by a parameter's higher points.

Revenue

Figure 2 Souvenir Shop Income Performance

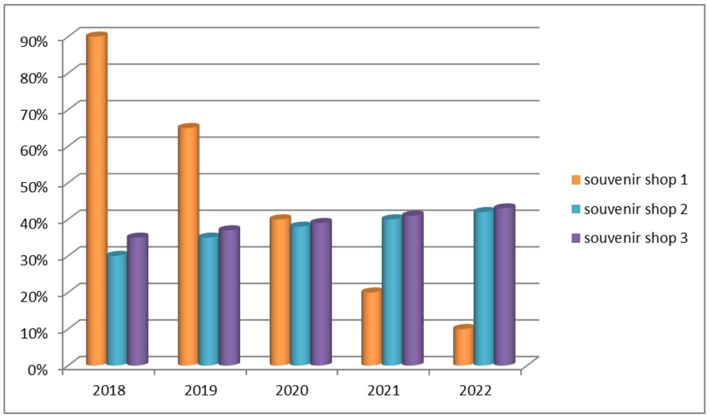


Figure 2 that shows above that the income of souvenir shop a quick glance at the graph indicates that souvenir shop revenue is increasing, indicating a solid business performance. Given that souvenir revenue is steadily declining, an examination of their operations suggests inefficiency and ineffectiveness.

The general expediency and efficiency of souvenir shop varies. They may also be more successful than others may, particularly when it comes to top management failing to carry out their duties successfully and poorly applied marketing, innovation, and differentiation plans. This is when the importance of strategies and personnel management increases.

FINDINGS

Zamboanga Peninsula's souvenir shops employ a variety of business strategies to remain competitive. They additionally provide their employees and staff incentives, safety, and positive aspects that motivate them to put in more effort for the higher production of their company. Furthermore, top-level executives are in control of overseeing operations and determining what innovations and commodities to provide to the market in order to survive the challenging commercial computations.

CONCLUSION

Even though the souvenir business encountered numerous challenges, it continued in expanding and strengthening the socio-economic growth of the local economy. With assistance of established marketing plans, executive leadership and experience, and contented staff members, they were able to preserve their growth. The revenue of the business, particularly Souvenir shop, increases with the use of all these techniques.

RECOMMENDATION

The researchers encourage the highest levels of management of souvenirs businesses to take advantage of the study in order to develop the ideal goods and services along with customer-demanding methods. A number of factors to be examined, including commission and incentives given to employees and staff to assist in achieving the company's objectives, innovation to boost competitiveness in the market, and the applicability of adopting differentiation strategies in the marketplace. To give a broad overview of what will be happening in your company's operations, top management has to prepare for succession planning.

The authors of this study may recommend further that, because souvenir shops support socioeconomic development, they be may use as markers of the sustainability of the establishment.

ACKNOWLEDGEMENT

The researchers extend gratitude to the people who supported them to materialized their endeavor, to their family member, friend, colleges, and also to the respondents

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EVALUATING THE IMPACT OF THOMASSEN'S CUSTOMER SATISFACTION MODEL IN THE OPERATIONS OF BUSINESSES IN THE FOURTH CONGRESSIONAL DISTRICT OF QUEZON

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ABSTRACT

This paper explored customer satisfaction in the Fourth Congressional District of Quezon. A quantitative method was employed to identify the factors that will increase customer satisfaction and evaluate the impact of Thomassen's customer satisfaction model regarding customer retention. The respondents of this study are the personnel on the secondary level of the public schools in the 4th Congressional District since the researcher connects this research to the School Maintenance and Other Operating Expenses (MOOE) fund. Questionnaires were sent to respondents in the form of Google Forms via link sent to their Facebook messenger. This study aims to evaluate the impact Thomassen's Customer Satisfaction Model in the Operations of Businesses in the Fourth Congressional District of Quezon. To fulfill the aim of this study, a quantitative method was used. It involves a comparison of customer's expectations versus customer's experiences related to factors to consider in Thomassen's Customer Satisfaction Model such as value proposition, word of mouth, past experiences, marketing, and public relations. This also involves the identification of significant differences in the level of satisfaction when the respondents are grouped according to their profile, the identification of challenges encountered by customers in achieving and maintaining their satisfaction level, and the identification of significant differences in the challenges when the respondents are grouped according to their profile. The researcher developed a proposed customer satisfaction program based on the given result.

Keywords: Value Proposition, word-of-mouth, personal needs, past experiences, marketing and public relation

INTRODUCTION

In today's dynamic marketplace, customer satisfaction reigns supreme. It's the lifeblood of loyalty, the anchor of repeat business, and the compass guiding brand reputation (Lemon & Peters, 2009). Recognizing this fundamental truth, businesses worldwide have embraced sophisticated models to navigate and optimize this critical metric. Among these models, Thomassen's Customer Satisfaction Model stands out for its robust framework and proven effectiveness in diverse contexts (Thomassen, 2004). However, when venturing into the unique waters of the Fourth Congressional District of Quezon, a crucial gap emerges: the absence of empirical research on the applicability and impact of Thomassen's Customer Satisfaction Model within this specific business environment.

While existing research has established the theoretical foundations of Thomassen's Customer Satisfaction Model and its success across various industries (Cronin & Taylor, 1992; Fornell et al., 1996), its application within the specific cultural, economic, and industry nuances of Quezon remains largely uncharted territory (Puntig & Tan, 2013). This lack of contextual understanding hinders businesses in the region from fully harnessing the potential of Thomassen's Customer Satisfaction Model.

Furthermore, the existing research on Thomassen's Customer Satisfaction Model has primarily focused on its relationship with customer-facing aspects like service quality and responsiveness (Narasimhan, 1988; Parasuraman et al., 1988). While undeniably crucial, this narrow lens overlooks the potential operational impact of implementing Thomassen's Customer Satisfaction Model. By delving deeper into changes in operational efficiency, cost structure, and employee engagement, this research seeks to paint a more comprehensive picture of how Thomassen's Customer Satisfaction Model influences the internal workings of businesses (Dessler, 1980; Pfeffer, 1998).

By addressing these critical gaps, this study aspires to make significant contributions to both academic and practical domains. Academically, it will provide valuable empirical evidence on the applicability of Thomassen's Customer Satisfaction Model within the Filipino context, enriching the discourse on culturally relevant models for customer satisfaction measurement. This aligns with the growing emphasis on understanding consumer behavior in diverse markets (Puntig & Tan, 2013).

Practically, the findings will offer actionable insights for businesses in Quezon to leverage Thomassen's Customer Satisfaction Model as a strategic tool for optimizing customer satisfaction, enhancing operational efficiency, and ultimately, achieving sustainable success. This aligns with the growing demand for research that bridges the gap between theoretical frameworks and practical applications, empowering businesses to make data-driven decisions (Hair et al., 2014).

Therefore, this research embarks on a critical voyage to navigate the uncharted waters of customer satisfaction within the vibrant business landscape of Quezon's Fourth Congressional District. By analyzing the effectiveness of Thomassen's Customer Satisfaction Model in this unique context, the study seeks to illuminate new pathways for businesses to thrive in the ever-evolving market and build lasting relationships with their valued customers.

STATEMENT OF THE PROBLEMS/OBJECTIVES

This study aims to evaluate the impact Thomassen's Customer Satisfaction Model in the operations of businesses in the 4th Congressional District. This study analyzes the impact of customer perception in connection to their level of satisfaction.

Research Questions:

1. What is the profile of the respondents in terms of:
   - 1.1 Age,
   - 1.2 Gender,
   - 1.3 Civil status and
   - 1.4 Average monthly income?
2. What is the level of satisfaction of the customers by comparing experiences and expectations along with:
   - 2.1 Value proposition
   - 2.2 Word of mouth
   - 2.3 Past experiences
   - 2.4 Marketing
   - 2.5 Public relations
3. Is there any significant difference in the level of satisfaction when the respondents are grouped according to their profile?
4. What are the challenges encountered by the customers in achieving and maintaining their satisfaction level?
5. Is there any significant difference in the challenges when the respondents are grouped according to their profile?
6. What customer satisfaction can be proposed to increase customer satisfaction level in the operation of businesses in the 4th Congressional District of Quezon.

METHODOLOGY

This study used the descriptive method in quantitative research. Methods used in descriptive research outline the features of the variables being examined. A quantitative market research or social research study includes descriptive research, which entails conducting survey research using quantitative variables on a market research tool or social research tool. In this study, the researcher interacts with the participants by using questionnaires in Google forms which are distributed by sending links to the participants.

The questionnaire survey consists of three parts: Part 1 is about the profile of the respondents. This section includes questions about age, sex, civil status, and monthly family income. This design aims to study the relationship among the said factors on customer satisfaction and also help assess the differences among different groups of customers. Part 2 is about the level of satisfaction of the customers by comparing their experiences and their expectations along with factors such as value proposition, word of mouth, past experiences, marketing, and public relations. Part 3 is about the challenges encountered by the customers in achieving and maintaining their satisfaction level.

The researcher gathered the populations of DepEd personnel on the secondary level of the Fourth Congressional District of Quezon and acquired the sample by using a statistical sampling technique. Two hundred ninety one (291) DepEd personnel in the Fourth Congressional District of Quezon in the secondary level were chosen as respondents of this study. This study used a quantitative design. The quantitative tools consist of a self-made survey to gather the profile of the respondents. The details gathered include the age, sex, civil status, and family income which will have a direct impact on their satisfaction level in terms of value proposition, word-of-mouth, past experiences, marketing, and public relations. The questionnaires also aim to gather their answers about the level of their satisfaction with the products and services of the MOOE suppliers. Those data were gathered through the distribution of questionnaires using Google Forms. With the help of some research practitioners and expert in the field, the survey questionnaires go through proper validation. To test the feasibility of a proposed study and to collect preliminary data on the study's participants and outcome measures, the researcher conducted a pilot testing on 20 representative respondents on each district who are not included on the respondents on the final survey. Cochran's equation was performed for the calculation of the sample size. Frequency-Percentage Distribution was used to quantify the findings regarding the respondents' personal profile. The assessment of the respondents' level of satisfaction and the challenges encountered in achieving and maintaining their satisfaction level was determined by using Weighted Average Mean. And finally, Kruskal Wallis H-Test was used to measure significant differences in the level of satisfaction and significant differences on the challenges encountered when the respondents are grouped according to their profile.

FINDINGS

1. Profile of the Respondents

Table 1. Profile of the Respondents

Personal Profile	Frequency	Percentage (%)	Rank
Age:			
18 to 29	69	23.71	2
30 to 39	105	36.08	1
40 to 49	68	23.37	3
50 to 59	40	13.75	4
60 and above	9	3.09	5
Total	**291**	**100**	
Sex:			
Male	94	32.3	2
Female	197	67.7	1
Total	**291**	**100**	
Civil Status:			
Single	110	37.8	2
Married	174	59.79	1
Widowed/er	6	2.06	3
Separated	1	0.34	4
Total	**291**	**100**	
Monthly Family Income			
15,000 to 29,999	145	49.83	1
30,000 to 39,999	84	28.87	2
40,000 to 49,999	42	14.43	3
50,000 to 59,999	10	3.44	4
60,000 and above	10	3.44	4
Total	**291**	**100**	

In terms of numbers of the respondents, as stated in the table above, the age bracket 30-39 ranked first, with a frequency of 105 and a percentage of 36.06%. The age 18-29 and above ranked second with a frequency of 69 and a percentage of 23.71%, and the age bracket of 60 and above in the last with frequency counts of 9 which is equivalent to 3.09%. Aside from the fact that age 30 to 39 age group belongs to those with more stable work and income, this finding is supported by the Philippine Statistics Authority (PSA). According to PSA, regarding the age distribution of workers in the schools in the Philippines in 2020,the majority of it were between the ages of 25 and 34 which support the findings that age 30-39 are the majority of this study's respondents.

Female respondents had the highest frequency count of 197, equivalent to 67.70% at rank 1 whereas male respondents came in second with a frequency of 94 or 32.30%. According to the Philippine Statistics Authority (PSA) regarding the gender distribution of workers in schools in the Philippines in 2020, there were more female workers in schools in the Philippines than male workers which support the findings that female are the majority of this study's respondents.

The married status ranked first, with a frequency of 174 and a percentage of 59.79%. The single status ranked second with a frequency of 110 and a percentage of 37.80%, and the separated status the last with frequency counts of 1 which is equivalent to 0.34%. According to the Philippine Statistics Authority (PSA), regarding the civil status distribution of workers in the schools in the Philippines in 2020, the majority of it is single followed by married respondents.

The salary range of 15,000 to 29,999 ranked first, with a frequency of 145 and a percentage of 49.83%. The salary range of 30,000 to 39,999 ranked second with a frequency of 84 and a percentage of 28.87%, and the salary range of 50,000 to 59,000 and 60,000 and above the last with a frequency count of 10 which is equivalent to 3.44%. According to the Philippine Statistics Authority (PSA), regarding the monthly family income distribution of workers in the schools in the Philippines, the majority of it comes from low- and middle-income families which support the findings that the respondents with family income from 15,000 to 29,999 are the majority of this study's respondents.

2. Level of Satisfaction of The Customers By Comparing Experiences and Expectations Along with the Following Dimensions:

Table 2. Level of Satisfaction of Customers by Comparing Experiences and Expectations

Dimension	Statement	EXPECTATION		EXPERIENCES		GAP SCORE	MEAN FOR DIMENSION
		Mean	Verbal Interpretation	Mean	Verbal Interpretation		
Value Proposition	The chosen store to supply the school needs delivers the value promised.	4.09	High	3.99	High	0.10	-0.088
	The location of the store is accessible.	4.24	High	4.08	High	0.16	
	The products of the store have a good quality.	4.1	High	4.04	High	0.06	
	The store has variety of products that makes them more competitive in product range and price.	4.04	High	4.01	High	0.03	
	The service was not lengthened by queues and delays.	3.98	High	3.89	High	0.09	
Word of Mouth	The chosen store satisfies our expectations, and we will definitely recommend it to others.	4.11	High	4.03	High	0.08	-0.076
	The chosen store conforms to our specifications, so we will definitely recommend it to others.	4.12	High	4.03	High	0.09	
	Positive evaluations and suggestions from others affect our decision to consider availing products from the store.	4.05	High	4.04	High	0.01	
	Negative evaluations and complaints from others about the store influence our decision to no longer consider availing products from the store.	3.96	High	3.84	High	0.12	
	E-word of mouth such as online comments, opinions, blogs, product reviews usually affect our purchasing decision.	3.96	High	3.88	High	0.08	

Past Experiences	In the past, our chosen store was able to deliver products that meet our perceived quality.	3.99	High	3.94	High	0.05	-0.07
	In the past, our chosen store was able to provide products that are reliable.	4.02	High	3.97	High	0.05	
	In the past, our chosen store was to able to deliver products and services through its responsive staff.	4.05	High	3.93	High	0.12	
	In the past, our chosen store was able to give us products that are quality assured.	4.07	High	3.98	High	0.09	
	In the past, our chosen store was able to deliver the products through their empathetic staff.	3.97	High	3.93	High	0.04	
Marketing	The quality of product/services provided by our chosen store worked as advertised.	4.1	High	3.96	High	0.14	-0.072
	The promotion made by our chosen store is admirable.	4.2	High	3.91	High	0.29	
	The price of the product offered by our chosen store is reasonable.	3.8	High	3.97	High	- 0.17	
	The product warranty of our chosen store is acceptable.	4.1	High	3.97	High	0.13	
	Our chosen store has established and maintained a mutually beneficial relationship with our school as customer.	4	High	4.03	High	- 0.03	
Public Relations	Our chosen store has friendly employees.	4.15	High	4.11	High	0.04	-0.072
	Our chosen store has knowledgeable employees.	4.16	High	4.08	High	0.08	
	Our chosen store has a quick service.	4.12	High	4.01	High	0.11	
	Our chosen store provides us with a clear billing.	4.14	High	4.08	High	0.06	
	Our chosen store issues our billing statement on time.	4.13	High	4.06	High	0.07	

2.1. Value Proposition

Table 2 shows that the verbal interpretation on both experience and expectation are high under value proposition dimension. Although, the gap score on every statement gets a negative score which implies dissatisfaction, the statement "The store has a variety of products that makes them more competitive in product range and price" gets the lowest negative gap score of 0.03". This entails although this means dissatisfaction, the respondents are almost satisfied with the products/services offered by the businesses in the Fourth Congressional District of Quezon. The statement "The location of the store is accessible." gets the highest negative gap score of -0.16 points. Since the respondents are all professionals who work eight hours a day, the store's accessibility is crucial. According to research, nearly three times as many people are satisfied with accessibility to the site as with accessibility to basic services, thus, in terms of infrastructure, transportation, and recreational amenities, the site itself is more significant and needs to be taken care of. (Udit Chawla, 2018)

A study by the American Customer Satisfaction Index (ACSI) (2021), found that there is a strong correlation between customer satisfaction and the perceived value of a product or service. The study found that customers who perceive that they are getting good value for their money are more likely to be satisfied with their purchase. The study also found that customer satisfaction is influenced by several factors, including the quality of the product or service, the price of the product or service, and the level of customer service. However, the study found that the perceived value of a product or service is the most important factor in determining customer satisfaction.

2.2. Word of Mouth

Under Word of Mouth dimension, the above table shows high verbal interpretations of both statements on expectation and experience. All of the statements show a negative gap score which means customer dissatisfaction. However, the statement "Positive evaluations and suggestions from others affect our decision to consider availing products from the store." gets the lowest negative gap score of -0.01 while the statement "Negative evaluations and complaints from others about the store influence our decision to no longer consider availing products from the store" gets the highest negative gap score of -0.12.

This result implies that handling complaints has a big impact on customer satisfaction. This is why understanding why customers complain will help you prevent complaints from occurring in the first place. Understanding why customers complain is one of the fundamental pillars of customer service, customer retention, and customer delight. This is supported by the statement (customerservicezone.com, 2006) that time could be saved by comprehending the causes of customer complaints and resolving issues before they arise.

A study by the American Customer Satisfaction Index (ACSI) (2021), found that there is a strong correlation between customer satisfaction and word-of-mouth. The study found that customers who are satisfied with a product or service are more likely to recommend it to others. The study also found that word-of-mouth is a powerful marketing tool. Customers are more likely to trust recommendations from friends and family members than they are to trust traditional advertising.

2.3.Past Experiences

The above table shows a high verbal interpretation under expectation and experience on Past Experiences dimension, however, all of the statement has a negative gap score which implies customer dissatisfaction. On the other hand, the statement “In the past, our chosen store was able to deliver the products through their empathetic staff” gets the lowest negative gap score of -0.04, while the statement “In the past, our chosen store was able to deliver products and services through its responsive staff” gets the negative highest gap score of -0.12.

Similar to a hotel's customer service system, responsiveness is simply the readiness to offer prompt service in various situations. Customers frequently have special requests, questions, or complaints; therefore, the service provider, especially front-line staff, should be prepared to handle them politely. The capacity to adapt, communicate, innovate, and concentrate on the idea of flexibility through training is necessary for this dimension (Johnston, 1997).

A study by the American Customer Satisfaction Index (ACSI) found that customer satisfaction is influenced by several factors, including past experiences. The study found that customers who have had positive past experiences with a product or service are more likely to be satisfied with it in the future.

The study also found that the more recent a customer's experience is, the more likely it is to influence their current satisfaction level. This is because customers are more likely to remember recent experiences than they are to remember past experiences.

2.4. Marketing

The above table finds high verbal interpretations under expectation and experience under marketing dimension. Unlike the previous statements on dimensions Value Proposition, Word of Mouth, and Past Experiences, out of five statements under the marketing dimension, only 2 statements get a positive score which implies customer satisfaction. The remaining 3 statements get a negative gap score which implies dissatisfaction that affects the overall grand mean with a score of -0.072. The statement “The price of the product offered by our chosen store is reasonable” got the highest positive gap score of 0.17, while the statement “The promotion made by our chosen store is admirable” got the highest negative gap score of -0.29.

The result implies that the businesses in the Fourth Congressional District are giving a product/ services at a reasonable price. As stated by Turel et al. 2006, the level of customer satisfaction with a brand is frequently determined by the services it provides and the price it charges, rather than by any other factor. On the other hand, the negative result of the promotion implies that choosing an admirable promotion has a crucial effect on customer satisfaction. Based on the research, customer satisfaction, and the overall customer experience are positively impacted by marketing communication in the form of promotional activities. (M. Bakator et al. 2018)

Another study by the American Customer Satisfaction Index (ACSI) (2021), found that there is a strong correlation between customer satisfaction and marketing. The study found that customers who are satisfied with the marketing of a product or service are more likely to be satisfied with the product or service itself.

2.5. Public Relations

Under Public Relations dimension, table 2 shows high verbal interpretations of both expectation and experience. Although the verbal interpretations are all high, all of the gap scores on the above statements are negative which means customer dissatisfaction with all of the above-mentioned criteria. The statement “Our chosen store has friendly employees” got the lowest negative gap score of -0.04 while the statement “Our chosen store has a quick service” got the highest negative gap score of -0.11. Since the respondents of this study are professionals who have eight-hour work days, they are aiming for fast and simple transactions as possible. According to Travis Vu, 2021, satisfaction will result from a quick and easy process, a positive attitude, and polite communication.

A study by the Public Relations Society of America (PRSA) found that there is a strong correlation between customer satisfaction and public relations. The study found that customers who are satisfied with the public relations of a company are more likely to be satisfied with the company's products and services.

The gap scores discussed above in this study reflect the satisfaction and dissatisfaction with products/services delivered to customers in the Fourth Congressional District of Quezon. To summarize the findings, based on the results of the questionnaire, it was determined that only 2 out of the 25 statements represented customer satisfaction and that 23 out of the 25 statements indicated a lower level of experience than expected, further demonstrating the dissatisfaction of customers in the 4th Congressional District of Quezon. This has caused the gap score for all five dimensions to be negative. However, the businesses in the 4th Congressional District of Quezon have performed well on the two statements under the marketing dimension, which ought to have affected the overall rating under the marketing dimension. Although the gap scores are all negative which implies dissatisfaction, the difference between the expectations and experiences is very minimal.

3. Test for Significant Difference in the Level of Satisfaction when the Respondents are Grouped According to their Profile

3.1. Experiences

Table 3. Kruskal Wallis H-Test: Comparison on the Level of Satisfaction Based on Their Experience

Profile	Indicators	Age	Mean Rank	K statistic	p-value	Decision	Remarks
AGE	Value Proposition	18 to 29	136	2.1	0.72	Failed to Reject Ho	Not Significant
		30 to 39	154				
		40 to 49	142				
		50 to 59	148				
		60 and above	150				
	Word of Mouth	18 to 29	150	1.96	0.74	Failed to Reject Ho	Not Significant
		30 to 39	147				
		40 to 49	139				
		50 to 59	156				
		60 and above	122				
	Past Experiences	18 to 29	145	2.04	0.73	Failed to Reject Ho	Not Significant
		30 to 39	142				
		40 to 49	146				
		50 to 59	162				
		60 and above	129				
	Marketing	18 to 29	137	4.54	0.34	Failed to Reject Ho	Not Significant
		30 to 39	144				
		40 to 49	142				
		50 to 59	169				
		60 and above	163				
	Public Relations	18 to 29	139	2.7	0.61	Failed to Reject Ho	Not Significant
		30 to 39	151				
		40 to 49	137				
		50 to 59	158				
		60 and above	156				
SEX	Value Proposition	Male	147	0.02	0.88	Failed to Reject Ho	Not Significant
		Female	145				
	Word of Mouth	Male	138	1.2	0.27	Failed to Reject Ho	Not Significant
		Female	150				
	Past Experiences	Male	150	0.37	0.54	Failed to Reject Ho	Not Significant
		Female	144				
	Marketing	Male	149	0.24	0.63	Failed to Reject Ho	Not Significant
		Female	144				
	Public Relations	Male	151	0.54	0.46	Failed to Reject Ho	Not Significant
		Female	144				

CIVIL STATUS	Value Proposition	Single	141	3.78	0.29	Failed to Reject Ho	Not Significant
		Married	148				
		Widowed/er	195				
		Separated	61				
	Word of Mouth	Single	141	0.82	0.85	Failed to Reject Ho	Not Significant
		Married	149				
		Widowed/er	148				
		Separated	110				
	Past Experiences	Single	147	0.02	1	Failed to Reject Ho	Not Significant
		Married	146				
		Widowed/er	148				
		Separated	155				
	Marketing	Single	136	3.62	0.31	Failed to Reject Ho	Not Significant
		Married	151				
		Widowed/er	177				
		Separated	195				
	Public Relations	Single	138	3.01	0.39	Failed to Reject Ho	Not Significant
		Married	149				
		Widowed/er	190				
		Separated	133				
MONTHLY FAMILY INCOME	Value Proposition	Below 15,000	0	11	0.03	Reject Ho	Significant
		15,000 to 29,999	145				
		30,000 to 39,999	155				
		40,000 to 49,999	113				
		50,000 to 59,999	181				
		60,00 and above	178				
	Word of Mouth	Below 15,000	0	8.08	0.09	Failed to Reject Ho	Not Significant
		15,000 to 29,999	145				
		30,000 to 39,999	150				
		40,000 to 49,999	124				
		50,000 to 59,999	201				
		60,00 and above	163				
	Past Experiences	Below 15,000	0	11.7	0.02	Reject Ho	Significant
		15,000 to 29,999	142				
		30,000 to 39,999	155				
		40,000 to 49,999	121				
		50,000 to 59,999	200				
		60,00 and above	185				
	Marketing	Below 15,000	0	11.7	0.02	Reject Ho	Significant
		15,000 to 29,999	143				
		30,000 to 39,999	152				
		40,000 to 49,999	121				
		50,000 to 59,999	208				
		60,00 and above	180				
	Public Relations	Below 15,000	0	9.12	0.06	Failed to Reject Ho	Not Significant
		15,000 to 29,999	145				
		30,000 to 39,999	153				
		40,000 to 49,999	119				
		50,000 to 59,999	198				
		60,00 and above	158				

3.1.1. Age

One of the major demographic factors that affect consumers' purchasing decisions is age. Age is a significant factor in marketing strategy, according to Rani (2014), because it makes a significant difference in consumer choices, consumption patterns, and habits. Age has been found to influence consumer decisions and choices (A. Bhatt & Bhatt, 2016). Younger consumers consider different brands, whereas older consumers are more loyal to more established brands (Chikazhe et al., 2021). As a result, the customer experience relationship is stronger with older consumers than with younger ones. However, it is found in this study that there is no significant difference in the weights on the Level of Satisfaction on the five indicators: value proposition, word of mouth, past experiences, marketing, and public relations, based on the experiences of the respondents when grouped according to age. This means that, from 18 years old to 60 years old and above, respondents have a similar level of satisfaction.

3.1.2. Sex

In terms of service, research and responses or findings by studies in the same domain can produce different results; some studies may conform while others may be significantly opposite. Consequently, the results of these studies vary because the characteristics are given more weight depending on the researcher's selection choice.

According to the findings of one study, good customer service analysis is caused by the gender of frontline service employees, as the service male and female staff models differ noticeably. Female quality interaction and service processes were taken into consideration by service employees. Male service encounter employees were more outcome-oriented and saw customer service as primarily an efficient problem-solving (Mathies & Burford, 2010).

In this study, it was found that there is no significant difference in the weights on the Level of Satisfaction on the five indicators: value proposition, word of mouth, past experiences, marketing, and public relations, based on the experiences of the respondents when grouped according to sex. This means that male and female respondents have similar levels of satisfaction

3.1.3. Civil Status

Married customers may have a stronger social support system, which can positively affect their overall well-being and satisfaction. This support can extend to customer experiences, as individuals in strong social networks may be more likely to recommend products or services to others. A study by Reichheld (2003) in the Harvard Business Review emphasizes the importance of customer referrals in business success.

On the other hand, research by Dube-Rioux and Laurin (2008) in the Journal of Consumer Research explores how life events can influence consumer choices and satisfaction. Customers who have recently experienced major life events like divorce or the loss of a spouse may have different needs and emotional states, which can impact their satisfaction levels.

However, contrary to the above-mentioned research, it is found in this study that there is no significant difference in the weights on the Level of Satisfaction based on the experiences on the five indicators: value proposition, word of mouth, past experiences, marketing, and public relations when the respondents are grouped according to civil status. This means that single, married, widowed/er, and separated respondents have a similar level of satisfaction with the products/services of the businesses in the fourth congressional district of Quezon.

3.1.4. Family Income

Results reveal in this study that there is a significant difference in the level of satisfaction (LOS) based on the experiences of the respondents when grouped according to family income in terms of value proposition. Also, since the mean LOS of the respondents with a range of monthly family income from 50,000 to 59,999 is greater than the respondents with other monthly family income ranges, it can be concluded that the respondents with a range of monthly family income from 50,000 to 59,999 possess higher LOS than the respondents with other monthly family income range in terms of a value proposition.

When it comes to word of mouth and public relations, results reveal that there is no significant difference in the LOS based on the experiences of the respondents when grouped according to family income.

On the other hand, there is a significant difference in the level of satisfaction (LOS) based on the experiences of the respondents when grouped according to family income in terms of past experiences. Since the mean LOS of the respondents with a range of monthly family income from 50,000 to 59,999 is greater than the respondents with other monthly family income ranges, it can be concluded that the respondents with a range of monthly family income from 50,000 to 59,999 possess higher LOS than the respondents with other monthly family income range about past experiences.

Similarly, on marketing indicator, there is a significant difference in the level of satisfaction (LOS) based on the experiences of the respondents when grouped according to family income. Since the mean LOS of the respondents with a range of monthly family income from 50,000 to 59,999 is greater than the respondents with other monthly family income ranges, it can be concluded that the respondents with a range of monthly family income from 50,000 to 59,999 possess higher LOS than the respondents with other monthly family income range in the aspect of marketing.

However, in one study about the banking industry, income has been shown to influence consumer decisions (Chawla & Joshi, 2017; Lee et al., 2015). Higher-income consumers can easily switch from one brand to another, whereas lower-income consumers are more loyal to specific brands because they may be unable to afford alternative brands (Chikazhe et al., 2021).

3.2. Expectations

Table 4. Kruskal Wallis H-Test: Comparison on the Level of Satisfaction Based on Their Expectation

Profile	Indicators	Age	Mean Rank	K statistic	p-value	Decision	Remarks
AGE	Value Proposition	18 to 29	136.4	5.543	0.236	Failed to Reject Ho	Not Signifi-cant
		30 to 39	153				
		40 to 49	133.1				
		50 to 59	165.6				
		60 and above	148.4				
	Word of Mouth	18 to 29	148.3	2.491	0.646	Failed to Reject Ho	Not Signifi-cant
		30 to 39	146.8				
		40 to 49	135.4				
		50 to 59	160.4				
		60 and above	135.8				
	Past Experiences	18 to 29	143.5	0.799	0.939	Failed to Reject Ho	Not Signifi-cant
		30 to 39	147.1				
		40 to 49	142.1				
		50 to 59	155.5				
		60 and above	140.6				
	Marketing	18 to 29	137.1	4.508	0.342	Failed to Reject Ho	Not Signifi-cant
		30 to 39	139.7				
		40 to 49	158.1				
		50 to 59	149.7				
		60 and above	179.8				
	Public Relations	18 to 29	143.6	0.584	0.965	Failed to Reject Ho	Not Signifi-cant
		30 to 39	149.9				
		40 to 49	141				
		50 to 59	148.5				
		60 and above	146.4				
SEX	Value Proposition	Male	153.6	1.158	0.282	Failed to Reject Ho	Not Signifi-cant
		Female	142.4				
	Word of Mouth	Male	142.9	0.195	0.659	Failed to Reject Ho	Not Signifi-cant
		Female	147.5				
	Past Experiences	Male	148	0.077	0.781	Failed to Reject Ho	Not Signifi-cant
		Female	145.1				
	Marketing	Male	150.5	0.414	0.52	Failed to Reject Ho	Not Signifi-cant
		Female	143.9				
	Public Relations	Male	149.1	0.192	0.661	Failed to Reject Ho	Not Signifi-cant
		Female	144.5				
CIVIL STA-TUS	Value Proposition	Single	142.4	1.804	0.614	Failed to Reject Ho	Not Signifi-cant
		Married	147.2				
		Widowed/er	161.1				
		Separated	243.5				
	Word of Mouth	Single	144.4	0.659	0.883	Failed to Reject Ho	Not Signifi-cant
		Married	146.7				
		Widowed/er	164.3				
		Separated	99				
	Past Experiences	Single	143.9	0.145	0.986	Failed to Reject Ho	Not Signifi-cant
		Married	147.5				
		Widowed/er	142.8				
		Separated	139.5				
	Marketing	Single	133	5.503	0.138	Failed to Reject Ho	Not Signifi-cant
		Married	154				
		Widowed/er	165.2				
		Separated	73				
	Public Relations	Single	142	0.523	0.914	Failed to Reject Ho	Not Signifi-cant
		Married	148.6				
		Widowed/er	149.7				
		Separated	122.5				

Monthly Family Income	Value Proposition	Below 15,000	0	3.255	0.516	Failed to Reject Ho	Not Significant
		15,000 to 29,999	144				
		30,000 to 39,999	151.8				
		40,000 to 49,999	136.7				
		50,000 to 59,999	129.9				
		60,00 and above	182				
	Word of Mouth	Below 15,000	0	8.066	0.089	Failed to Reject Ho	Not Significant
		15,000 to 29,999	141.8				
		30,000 to 39,999	154.2				
		40,000 to 49,999	126.4				
		50,000 to 59,999	195.8				
		60,00 and above	171.6				
	Past Experiences	Below 15,000	0	8.648	0.071	Failed to Reject Ho	Not Significant
		15,000 to 29,999	141.3				
		30,000 to 39,999	157.1				
		40,000 to 49,999	123.6				
		50,000 to 59,999	179.9				
		60,00 and above	181.8				
	Marketing	Below 15,000	0	2.896	0.575	Failed to Reject Ho	Not Significant
		15,000 to 29,999	141.9				
		30,000 to 39,999	146.3				
		40,000 to 49,999	164.7				
		50,000 to 59,999	132.7				
		60,00 and above	138.4				
	Public Relations	Below 15,000	0	7.913	0.095	Failed to Reject Ho	Not Significant
		15,000 to 29,999	146.7				
		30,000 to 39,999	151.7				
		40,000 to 49,999	119				
		50,000 to 59,999	189.8				
		60,00 and above	157.9				

3.2.1. Age

According to J. Lewis (2015), to provide exceptional customer service across generations, support representatives must understand the differences in defining good customer service and the unique aspects of communicating with customers of various ages. And, without a doubt, they must be able to respond appropriately to the expectations of each group.

However, it is found that there is no significant difference in the weights on the Level of Satisfaction on the five indicators: value proposition, word of mouth, past experiences, marketing, and public relations, based on the expectations of the respondents when grouped according to age. This means that respondents aged 18 to 60 years old and above have a similar level of satisfaction.

3.2.2. Sex

It was found that there is no significant difference in the weights on the Level of Satisfaction on the five indicators: value proposition, word of mouth, past experiences, marketing, and public relations, based on the expectations of the respondents when grouped according to sex. This means that the male respondents have a similar level of satisfaction to the female respondents.

The result of this study is slightly similar to the findings of another study. Female customers had higher assurance expectations of staff with knowledge and courtesy, while men had higher expectations of staff with professionalism, and there was no difference in trustworthiness and staff competence. Female customers, on average, had higher expectations of banks and staff who were courteous, provided personal attention, provided accurate information, were helpful, and maintained clean facilities. Male customers had higher expectations of banks and staff who were professional, respectful, provided realistic information, worked long hours, and used modern technology. However, the overall correlation of satisfaction with gender was not significant in this study (Albert, Njanike, & Mukucha, 2010).

3.2.3. Civil Status

It is found that there is no significant difference in the weights on the Level of Satisfaction on the five indicators: value proposition, word of mouth, past experiences, marketing, and public relations, based on the expectations of the respondents when grouped according to civil status. This means that single, married, widowed/er, or separated respondents have a similar level of satisfaction.

Businesses often segment their customer base to better tailor their products, services, and marketing efforts. Civil status can be one of the segmentation variables used to customize offerings to specific customer groups, potentially leading to higher satisfaction. A reference for this concept can be found in Kotler and Keller's "Marketing Management" textbook.

Different civil statuses may lead to varying consumer behaviors. For instance, married customers may make different purchasing decisions than single customers, such as buying products or services for a family rather than individual consumption. Research by Sheth and Mittal (2004) in the Journal of Consumer Psychology discusses how consumer behavior is influenced by social and personal factors.

3.2.4. Monthly Family Income

Results reveal that there is no significant difference in the level of satisfaction (LOS) based on the expectations of the respondents when grouped according to family income in terms of value proposition. This means that the respondents with family income ranging from below P15,000 to P60,000 and above have a similar level of satisfaction based on expectations.

On the contrary, "The Impact of Income on Customer Expectations and Satisfaction" by Ying Li et al. found that customers with higher incomes have higher expectations for product quality, customer service, and convenience. The findings of this study have implications for businesses of all sizes. It is also stated in this study that businesses should be aware that customers with higher incomes have higher expectations. To meet these expectations, businesses should focus on providing high-quality products and services, excellent customer service, and convenient shopping experiences.

4. Challenges Encountered by the Customers in Achieving and Maintaining their Satisfaction Level

Table 4. Respondent's Assessment on the Challenges Encountered in Achieving and Maintaining their Satisfaction Level

Challenges Encountered	Mean	Verbal Interpretation
We encountered difficulty on accessing our chosen store using online platform.	2.44	Rarely
Our chosen store has a slow response for customer service/ complaints.	2.32	Rarely
Our chosen store has a poor after-sales support.	2.25	Rarely
Our chosen store has an incompetent support staff.	2.16	Rarely
Our chosen store failed to meet customer expectation.	2.16	Rarely
Our chosen store would frequently transfer our call to their source.	2.15	Rarely
Our chosen store is offering wrong solutions.	2.10	Rarely
Our school encounters difficulty in returning damaged items.	2.14	Rarely
Our chosen store has a high price but low quality product.	2.14	Rarely
Our chosen store has a lengthened service due to long queues.	2.16	Rarely
Grand Mean:	**2.20**	**Rarely**

The finding in this study indicates that the respondents rarely encountered challenges in achieving and maintaining their satisfaction Level.

Another statement from the study by Ying Li et al. (2017), customers' expectations are constantly changing, and it can be difficult for businesses to keep up. Businesses need to be able to understand what their customers want and need, and then deliver on those expectations.

As per the statement from the study of Yuh-Hsiang Lee and Min-Hsuan Hung (2016), once a business has achieved customer satisfaction, it is important to maintain it. This can be difficult, as customers' expectations can change and new competitors may emerge. Businesses need to be constantly innovating and improving their products and services to keep their customers satisfied.

These research findings suggest that businesses need to be aware of the rarely encountered challenges in achieving and maintaining customer satisfaction levels. Businesses need to develop strategies to address these challenges to meet the expectations of their customers and achieve long-term success.

5. Significant Difference on the Challenges Encountered when the Respondents are Grouped According to their Profile

Table 5 Kruskal Wallis H-Test: Comparison on the Challenges Encountered when the Respondents are Grouped According to their Profile

Profile	Indicators	Age	Mean Rank	K statis-tic	p-value	Decision	Remarks
AGE	Challenges Encoun-tered	18 to 29	156	3.65	0.46	Failed to Reject Ho	Not Significant
		30 to 39	141				
		40 to 49	153				
		50 to 59	128				
		60 and above	157				
SEX	Challenges Encoun-tered	18 to 29	156	3.65	0.46	Failed to Reject Ho	Not Significant
		30 to 39	141				
		40 to 49	153				
		50 to 59	128				
		60 and above	157				
CIVIL STATUS	Challenges Encoun-tered	Single	149	1.74	0.63	Failed to Reject Ho	Not Significant
		Married	144				
		Widowed/er	156				
		Separated	47.5				
MONTHLY FAMILY INCOME	Challenges Encoun-tered	Below 15,000	0	2.63	0.62	Failed to Reject Ho	Not Significant
		15,000 to 29,999	149				
		30,000 to 39,999	141				
		40,000 to 49,999	156				
		50,000 to 59,999	130				
		60,00 and above	118				

5.1. Age

Results reveal that there is no significant difference in the challenges encountered when the respondents are grouped according to their age. This means that the respondents with the age bracket from 18 years old to 60 years old and above have similar challenges encountered.

However, a study by Tiruwa et al. (2018), found that the challenges in achieving customer satisfaction varied depending on the age group of the respondents. The challenges from the age group 20-30 are price, quality, and delivery, from 30-40 are quality, customer service, and delivery, for 40-50 are customer service, product selection, and delivery, for 50-60 are product selection, customer service, and delivery and for 60 and above are price, product selection, and delivery. The study by Tiruwa et al. (2018) also found that customer satisfaction was generally highest among the youngest age group (20-30) and lowest among the oldest age group (60+).

5.2. Sex

Results reveal that there is no significant difference in the challenges encountered when the respondents are grouped according to sex. This means that male and female respondents have similar challenges encountered.

A study by the American Customer Satisfaction Index (ACSI) found that there were some differences in the challenges faced by men and women in achieving customer satisfaction. According to ACSI, the challenges that male encounters are price, quality, and customer service; while the challenges that female encounters are quality, customer service, and product selection. The study also found out that the study also found that women were generally more satisfied with customer service than men.

5.3. Civil Status

Results reveal that there is no significant difference in the challenges encountered when the respondents are grouped according to civil status. This means that single, married, widow/er, and separated respondents have similar challenges encountered.

A study by the University of Maryland found that the challenges in achieving customer satisfaction varied depending on the civil status of the respondents. According to this study, the challenges that the single encounters are price, product selection, and delivery; married encounters challenges on quality, customer service, and delivery; divorced encounters challenges in customer service, product selection, and delivery; and widowed/er encounters challenges on price, quality, and delivery. The study also found that customer satisfaction was generally highest among married couples and lowest among widowed individuals.

5.4. Monthly Family Income

Results reveal that there is no significant difference in the challenges encountered when the respondents are grouped according to monthly family income. This means that the respondents with a monthly family income bracket from below P15,000 to P60,000 and above have similar challenges encountered.

A study by the American Customer Satisfaction Index (ACSI) found that there were some differences in the challenges faced by customers of different income levels in achieving customer satisfaction. Low-income earner encounters challenges with price, quality, and customer service; medium-income earners encounter challenges with quality, customer service, and product selection; and high-income earners encounter challenges with product selection, customer service, and delivery. The study also found that customers with higher incomes were generally more satisfied with customer service than those with lower incomes.

CONCLUSION

Results indicate that a significant majority of the respondents express dissatisfaction with the products/services of the businesses in the Fourth Congressional District of Quezon. Although the result implies dissatisfaction, the gap score between expectation and experience is minimal.

There is no significant difference in the level of satisfaction based on their experience when the respondents are grouped according to their profile. A small sample might not have enough power to detect true differences, even if they exist. This implies that replication with a larger or different sample might be necessary.

There is no significant difference in the level of satisfaction based on the expectation of the respondents when they are grouped according to their profile on the indicators: Word of mouth, and public relations, however, there is a significant difference under value proposition, past experiences, and marketing indicator when the respondents are grouped according to the average monthly income. Same with the implication stated on conclusion number two (2), a replication with a larger sample or different sample might be necessary.

The respondents rarely encounter challenges in achieving and maintaining their satisfaction Level. If respondents rarely encounter challenges, their satisfaction may be less likely to fluctuate due to external factors or minor issues. Respondents likely face minimal obstacles or hassles in using the product or service, creating a smooth and enjoyable experience that fosters satisfaction.

There is no significant difference in the challenges encountered when the respondents are grouped according to their profile. This might imply that the sample size and statistical power were insufficient to detect subtle differences between groups. A larger study might reveal more nuanced patterns.

RECOMMENDATION

Employees should be given the authority to resolve customer dissatisfaction issues without having to go through multiple levels of management. This will help to ensure that customer dissatisfaction issues are resolved quickly and efficiently. It is better to create a customer dissatisfaction reporting system. Businesses in the 4th congressional district should create a system for tracking and reporting customer dissatisfaction issues. This will help businesses to identify patterns and trends in customer dissatisfaction and to develop strategies to address these issues. And lastly, provide a customer feedback to improve operations. Businesses in the 4th congressional district should use customer feedback to improve their operations and to prevent customer dissatisfaction issues from happening in the first place

For future researchers, since the respondent of this study is only focused on the products and services that are spent by using a School MOOE fund, future researchers could explore this topic in more depth by conducting this study in a different set of respondents, to explore this topic on using the respondents own fund and availing the products and services for their own consumption.

Future researchers may also conduct a qualitative study in which focus groups or in-depth interviews to understand the underlying reasons behind respondents' satisfaction. This can provide richer context and inform targeted solutions.

SHORT ACKNOWLEDGEMENT

I am extremely thankful to my supervisor Dr. Melchor Espiritu for his guidance, support with full encouragement and enthusiasm.

I am also grateful to my adviser, Dr. Orbel Canoy for his valuable suggestions, ever encouraging and motivating guidance.

I also would like to give thanks to all the members of the panel and to my classmates Ms. Aimee Verdeflor, Cris Anne Lota, Mar Jonathan Flores and Rea Mariz Jordan who directly and indirectly provide me inspirations and valuable suggestion during the course of this study.

Very special thanks to my sister Elenita B. Besabe who were always there with me and for providing me her valuable suggestions regarding data analysis.

I would also like to thank all of my friends and family members for encouraging and supporting me whenever I needed them.

Above all, to the Great Almighty, the author of knowledge and wisdom, for His continues blessings.

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EXPLORING CULINARY INNOVATIONS: ASSESSING THE ACCEPTABILITY OF CREAMY FRIED ADOBO AMONG BTVTE STUDENTS

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ABSTRACT

In the pursuit of culinary innovation, the study delves into the acceptability of creamy fried adobo among Bachelor of Technology and Vocational Technical Education (BTVTE) students at Sultan Kudarat State University Isulan campus during the AY 2021-2022 first semester. Building upon this intriguing premise, the primary objective is to comprehensively explore the students' reception of creamy fried adobo, scrutinizing critical aspects such as aroma, color, palatability, overall satisfaction, practicality, and commercial value. Employing a descriptive and quantitative research approach, the study utilizes a 5-point Likert scale in a survey format to measure the satisfaction levels of 40 BTVTE students. The survey, conducted through physical questionnaires, encompasses various categories tailored to evaluate specific dimensions of the dish's acceptability. The findings of this investigation present a favorable response to the innovative culinary creation—respondents express appreciation for the quality of creamy fried adobo, affirming its acceptability across multiple criteria. Specifically, the dish stands out in terms of aroma, color, palatability, overall satisfaction, practicality, and commercial value, showcasing its broad appeal and adaptability to diverse preferences. In conclusion, this research contributes valuable insights into the acceptability of creamy fried adobo among BTVTE students. The positive feedback received not only underscores the sensory appeal of the dish but also highlights its practicality and commercial viability in the realm of contemporary gastronomy. This innovative twist on a classic favorite has the potential to become a well-accepted addition to culinary preferences.

Keywords: Culinary Innovation, BTVTE, contemporary gastronomy, creamy fried adobo, Culinary

INTRODUCTION

Immersing oneself in a food-centric family means intertwining life's events with distinct culinary experiences. In our gastronomic almanac, akin to the precision of astrology, these dishes routinely announce the impending arrival of noteworthy events throughout the year.

Adobo is one of the most popular dishes in the Philippines because it tastes so pleasing to the Filipino tongue that some people crave it. Adobo is a relatively easy dish because it only consists of a few kilos of meat (chicken, pork, or beef), soy sauce, and spices. Adobo, likely the first Filipino dish to gain popularity abroad, is so embedded in Philippine culture that there are as many variations of it as there are islands in the country (more than 7,100 during low tide) (DeWitt, 2010; Silud. 2022)

Empirically speaking, there may be a greater variety of adobo since almost every Filipino family worldwide has its unique version of this dish. There is much misunderstanding about this meal because of the word "adobo." Some believe that the Filipino adobo was created due to Spanish or Mexican influence because the term "adobo" is also used in those cuisines (Sharwin et al.).

According to sources, the Filipino adobo is entirely original, and it only received this name because the Spanish invaders were unaware of this meal and wanted to make it simpler for people to recognize. Similar to the majority of Filipino meals, variations of a dish have developed based on geographic location and ingredient accessibility.

In the Philippines, there are so many different recipes for adobo that people always enjoy. In this situation, the researcher devised an idea to let Sultan Kudarat State University students taste another type of adobo they had never tasted or heard before. In this study, the researcher evaluated the acceptability level of the adobo dish the students tasted.

STATEMENT OF THE PROBLEM

This study aims to determine the acceptability of the "Creamy Fried Adobo" among the students of SKSU.

Specifically, this study seeks to answer the following questions:

1. What is the acceptability level of creamy fried adobo in terms of?
   1.1 Aroma
   1.2 Color
   1.3 Palatability
   1.4 Overall Satisfactory
2. What is the acceptability level of creamy fried adobo in terms of?
   2.1 Practicality
   2.2 Commercial Value

METHODOLOGY

This study, titled "Creamy Fried Adobo: A New Taste for a Classic Favorite," employed a mixed-method research design. This approach involved the integration of both qualitative (descriptive) and quantitative (experimental) research methods. This investigation holds significance in assessing the acceptability of the adobo variant among students. Respondents for the study were selected through random sampling, specifically targeting students enrolled in the Bachelor in Technical Vocational Teacher Education (BTVTE) program at Sultan Kudarat State University, Isulan Campus.

In this study, the researchers skillfully developed their interpretation of the adobo dish, showcasing a creative transformation. The traditional adobo recipe underwent a metamorphosis, resulting in the creation of Creamy Fried Adobo—a culinary masterpiece that not only introduces a contemporary flair but also offers a luxurious and indulgent take on the ageless classic. The innovative twist in flavor and texture brings a refreshing dimension to the well-loved dish, inviting a new sensory experience for those savoring this reimagined culinary delight. This study utilized a convenience sampling technique to determine its research respondents. Questionnaires are given to respondents. The questionnaires are forwarded to the research respondents to collect data and information.

The researcher used a survey questionnaire as the main instrument for gathering necessary data. Aside from the questionnaire, the researcher also provided dish samples for the respondents to evaluate the product.

Rating	Range	Descriptive Rating	Interpretation
5	4.21- 5.00	Superior	Highly Acceptable
4	3.41- 4.20	Very Good	Slightly Acceptable
3	2.61-3.40	Good	Moderately Acceptable
2	1.81-2.60	Fair	Slightly Unacceptable
1	1.00 -1.80	Poor	Highly Unacceptable

The 5 Likert scale is a five-point scale that allows individuals to express how much they agree or disagree with a particular statement. Likert scale typically provides five possible answers to a statement or question that enable respondents to indicate their positive-to-negative strength of agreement or strength of feeling regarding the question or statement (McLeod, S., 2008)

Before gathering data, the researcher asked permission from the school through a letter of request to allow him to conduct his study. As soon as the request was granted, the researcher administered and distributed the questionnaire on the Level of Acceptability of Creamy Fried Adobo by distributing the survey questionnaire forms to the students physically together with the prepared sample of the dish. The respondents were given enough time to answer all the items in the questionnaire. The researcher indicated the test directions for the students to understand on the survey form before answering. The data gathered from the questionnaire was collected, tabulated, and

interpreted accordingly. In this study, the researcher used descriptive statistics mean and weighted formula to convert the numerical data gathered from the questionnaire. Only tallying and getting percentages were the methods needed to come up with a conclusion on this study. Descriptive statistics, including a basic summary of the data gathered, were used to explain the study's result further.

Weighted Mean Formula: $x = \frac{(f1x1+f2x2+f3x3+f4x4+f5x5)}{Xf}$

Where

f = weight given to each response

x= number of responses

Xf = total number of responses

PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

Table 1. Acceptability level of creamy fried adobo in terms of aroma

Indicators	Average Scores	Interpretation
1. The product has a pleasant aroma	4.10	Very Acceptable
2. The product has a distinct aroma compared to the classic adobo	3.98	Very Acceptable
3. The product aroma is appetizing	3.84	Very Acceptable
4. The aroma highly influences the product's flavor	3.76	Very Acceptable
5. The aroma is not appealing	2.16	Slightly Unacceptable
Weighted Computed Mean	**3.57**	**Very Acceptable**

Table 1 provides a comprehensive overview of the sensory evaluation focusing on aroma. The findings indicate unanimous agreement among the respondents regarding the product's aroma, as reflected by an impressive average score of 4.10. Notably, the participants acknowledged the distinctiveness of the product's fragrance when compared to the classic adobo, assigning it an average score of 3.98. Furthermore, the aroma's appetizing quality received a commendable score of 3.84. Of particular significance is the observation that the aroma significantly influences the overall flavor of the product, as evidenced by the ratings of 3.76 for appeal and 2.16 for non-appeal. The resulting weighted mean of 3.57 underscores the widespread acceptance of the product, particularly in terms of its aroma.

Reinforcing these findings emphasizing the pivotal role aromas play in shaping our perception of food. According to the author, individuals may be deterred from consuming certain foods if they find their scent disagreeable. The resonant connection between aroma and consumer preference is corroborated by the positive response from the respondents, indicating a strong affinity for the food's enticing fragrance. Recognizing the essential role of aroma in culinary experiences, these results affirm that, alongside visual appeal, captivating aromas play a key role in capturing consumers' interest and satisfaction (Keefee, 2019).

Table 2. Acceptability level of creamy fried adobo in terms of Color

Indicators	Average Scores	Interpretation
1. The product has an appealing color	3.94	Very Acceptable
2. The protein and the sauce have a balanced color	3.88	Very Acceptable
3. The color complements the taste of the menu	3.98	Very Acceptable
4. The product has a variety of color	3.22	Very Acceptable
5. The color of the product is blunt	2.18	Slightly Unacceptable
Weighted Mean	**3.44**	**Very Acceptable**

The presented table provides a nuanced analysis of the impact of color on the sensory evaluation of the menu. Remarkably, the color component not only garnered the highest commendation but also demonstrated a significant correlation with the overall taste of the menu, achieving an impressive average score of 3.98. After this, the product's visually appealing color earned a commendable average score of 3.94, indicating a positive aesthetic influence. Furthermore, the balanced color of both protein and sauce, with a score of 3.88, further contributes to the overall positive perception of the dish. In contrast, variations in the product's color, particularly instances of bluntness, were associated with lower scores of 3.22 and 2.18. Despite these variations, the color category achieved a favorable weighted mean of 3.44, signifying its broad acceptability among respondents.

Undoubtedly, achieving the perfect color is a pivotal factor in fostering food acceptance, generating a positive sense of liking, and consequently influencing overall food intake. The visual appeal of a dish, anchored in its well-crafted and aesthetically pleasing color, serves as a crucial determinant that captivates the consumer's attention. This initial attraction sets the stage for a favorable perception, creating a positive predisposition toward the food item. As a result, the harmonious interplay of colors not only enhances the overall sensory experience but also establishes a foundation for a more satisfying and enjoyable culinary journey (C Spence,2015).

Table 3. Acceptability level of creamy fried adobo in terms of Palatability

Indicators	Average Scores	Interpretation
The menu is delicious	4.18	Very Acceptable
The product’s flavor is well-balanced	3.86	Very Acceptable
The product’s taste is new to the masses	3.55	Very Acceptable
The menu's meat is tender	3.59	Very Acceptable
The flavor of the meat comes out naturally	3.35	Very Acceptable
Weighted Mean	**3.71**	**Very Acceptable**

The table provides a comprehensive insight into the palatability of the menu, offering a nuanced understanding of its taste characteristics. Impressively, the highest score of 4.18 attests to the menu's exceptional deliciousness, positioning it as a culinary delight. Following closely is the product's well-balanced flavor, earning a noteworthy score of 3.86, indicative of a harmonious and pleasing taste profile. Moreover, the menu's tenderness received favorable recognition with an average score of 3.59, underlining a delightful textural aspect. Additionally, the product's introduction of a new taste to the masses garnered positive feedback, registering a score of 3.55, showcasing its innovative and appealing flavor profile. Lastly, the natural emergence of the meat's flavor, though slightly trailing, still achieved a respectable average score of 3.35.

The calculated weighted mean of 3.71 solidifies the overall palatability rating as highly acceptable. This synthesis of taste elements, as reflected in the scores, contributes to a robust and positive gastronomic experience. The findings underscore not only the menu's deliciousness but also its ability to offer a well-balanced and innovative taste, demonstrating broad appeal and satisfaction among the evaluators.

Palatability correlates directly with the enjoyment one derives from consuming a specific food, relying on a combination of sensory attributes such as taste, aroma, texture, and visual presentation. Foods that are sweet and rich in fats possess an undeniable sensory allure, engaging multiple senses to enhance the overall eating experience. This goes beyond mere nourishment, as food transcends its functional role and is frequently savored for the inherent pleasure it imparts. The complex interplay of sensory elements underscores the multifaceted nature of palatability, where the synergy of flavors, aromas, textures, and visual appeal converges to create a gratifying and holistic culinary sensation (Eufic, 2006).

Table 4. Overall Acceptability of creamy fried adobo

Overall Satisfaction	Average Scores	Interpretation
The menu is satisfying in all aspects	3.98	Very Acceptable
The quality of the menu is excellent	3.47	Very acceptable
The menu is served fresh	3.31	Very Acceptable
The menu is tasty and flavorful	4.00	Very Acceptable
The menu is presentable,	3.53	Very Acceptable
Weighted Mean	**3.66**	**Very Acceptable**

The comprehensive assessment of the Overall Satisfactory rating elucidates the multifaceted dimensions of the dining experience. Evidently, the pinnacle of satisfaction is reflected in the highest score of 4.00, indicating that the menu not only surpasses expectations but also delivers a delectable and flavorful culinary encounter.

Following closely is the acknowledgment that the menu is satisfying across all aspects, attaining a commendable score of 3.94. This underscores the holistic excellence of the dining experience, encompassing various elements that contribute to overall satisfaction. Additionally, the menu's presentation garners favorable recognition, achieving an average score of 3.53, attesting to its aesthetic appeal and visual allure. Furthermore, the exceptional quality of the menu secures a noteworthy standing, described as excellent, and the menu's commitment to freshness, although trailing slightly, maintains a respectable average score of 3.31.

The calculated weighted mean of 3.66 further solidifies the overarching conclusion that the overall satisfactory rating is deemed very acceptable. This collective evaluation not only reaffirms the menu's tastiness and flavorfulness but also underscores its success in delivering a satisfying, visually appealing, and high-quality dining experience, making it a well-rounded and gratifying culinary offering.

Table 5. Acceptability level of creamy fried adobo in terms of Practicality

Indicators	Average Scores	Interpretation
The menu is easy to cook	3.39	Very Acceptable
The ingredients are affordable	3.96	Very Acceptable
The ingredients are easy to find	3.69	Very Acceptable
The uniqueness of the product within the locality	3.31	Very Acceptable
The Menu presents creativity and innovation	3.63	Very Acceptable
Weighted Mean	**3.60**	**Very Acceptable**

Table 5 delineates the findings related to the practicality aspect of the dish. Respondents overwhelmingly concurred on the affordability of the ingredients, assigning an appreciable score of 3.96. Additionally, the ease of locating the dish's ingredients received a favorable acknowledgment, attaining a noteworthy score of 3.69. The creative presentation of the menu and its innovative elements was closely followed, garnering scores of 3.63. Furthermore, respondents recognized the dish for its ease of preparation, registering a score of 3.39. The product's unique positioning within the local context, while slightly trailing, still received commendable recognition with a score of 3.31.

These evaluations collectively depict a positive perception of the dish's practicality, highlighting its cost-effectiveness, accessibility of ingredients, creative presentation, and innovative elements. The nuanced consideration of ease of preparation and the dish's unique appeal within the local context further enriches the comprehensive understanding of its practical aspects.

Table 6. Acceptability level of creamy fried adobo in terms of Commercial Value

Commercial Value	Average scores	Interpretation
The product has commercial potential	3.67	Very Acceptable
The product will be patronized by the consumers	3.69	Very Acceptable
The product is cheap but profitable	3.55	Very Acceptable
The product’s appearance and flavor are appetizing	3.90	Very Acceptable
The packaging is easy and stylistic	3.90	Very Acceptable
Weighted Mean	**3.74**	**Very Acceptable**

The data provides a comprehensive overview of the product's commercial value assessment. The product stands out with a top score of 3.90, indicating strong visual and sensory appeal due to its excellent appearance, enticing flavor, and stylish packaging. Consumer preference is evident, with a commendable average score of 3.69, showcasing the product's popularity and acceptance in the market. Recognizing its commercial potential, the evaluation awards a noteworthy score of 3.67, emphasizing prospective success and marketability. Additionally, the product's dual characteristic of being affordable and profitable, with a score of 3.55, signifies a balanced economic appeal. The calculated weighted mean of 3.74 conclusively affirms the product's high acceptability in commercial terms, underscoring its compelling attributes, popularity, market potential, and economic viability.

Table 7. Summary of the Findings

Sensory Attributes	Weighted Mean Scores	Interpretation
Aroma	3.57	Very Acceptable
Color	3.44	Very Acceptable
Palatability	3.71	Very Acceptable
Overall Satisfaction	3.66	Very Acceptable
Practicality	3.60	Very Acceptable
Commercial Value	3.74	Very Acceptable

CONCLUSION

The data analysis findings indicate a high acceptance level among BTVTE students for creamy fried adobo across various dimensions. The mean scores reveal consistently positive perceptions:

1. The results indicate positive perceptions among BTVTE students for Creamy Fried Adobo. The aroma is highly acceptable, with an overall mean of 3.57, highlighting a favorable sensory experience. The color is also well-received, attaining an overall mean of 3.44, indicating visual appeal. Palatability is highly accepted, with an overall mean of 3.71, emphasizing the pleasing taste of the dish. Overall satisfaction is notably high, reflected in an overall mean of 3.66, indicating that the dish was well-received and met the expectations of BTVTE students.
2. The evaluation reveals positive insights into the practicality and commercial value of Creamy Fried Adobo among BTVTE students. In terms of practicality in cooking, the dish is considered very acceptable, with an overall mean of 3.60, implying that it is perceived as convenient and feasible for incorporation into culinary practices. Additionally, the commercial value is notably high, with an overall mean of 3.74, indicating that BTVTE students recognize the dish's potential market appeal and economic viability.

In summary, the results affirm that creamy fried adobo has garnered significant positive attention among BTVTE students in terms of sensory aspects, its practicality, and potential commercial success. These findings contribute valuable insights into the acceptability of this innovative culinary variation, suggesting its potential as a well-received addition to contemporary gastronomic preferences.

RECOMMENDATION

Based on the overwhelmingly positive findings indicating a high level of acceptability for creamy fried adobo among BTVTE students, several recommendations can be made to capitalize on the success of this innovative culinary variation:

1. Menu Integration: Considering the favorable responses to the aroma, color, palatability, and overall satisfaction, it is recommended to integrate creamy fried adobo into the regular menu offerings of culinary programs at Sultan Kudarat State University. This can provide students with exposure to diverse cooking techniques and flavors.

2. Promotion and Marketing: Given the perceived commercial value and potential market appeal, there is an opportunity to promote creamy fried adobo beyond the campus. Initiatives such as food festivals, social media campaigns, or collaborations with local eateries could help create awareness and generate interest in this unique dish.

3. Recipe Standardization: To maintain consistency in the positive sensory experience reported by respondents, it is advisable to develop standardized recipes for creamy fried adobo. This ensures that the dish consistently meets the high expectations of BTVTE students and potential consumers.

4. Culinary Training: Offer specialized training sessions or workshops on preparing creamy fried adobo within the culinary curriculum. This enhances students' culinary skills and provides hands-on experience creating a dish with proven high acceptability.

5. Exploration of Variations: Encourage culinary students to explore variations of creamy fried adobo, incorporating different ingredients or regional influences. This can contribute to culinary innovation and expand the range of offerings in response to diverse preferences.

6. Collaboration with Industry Partners: Establish collaborations with local restaurants, cafes, or food businesses to introduce creamy fried adobo to a broader audience. Such partnerships can provide valuable real-world exposure for BTVTE students and create potential avenues for the commercialization of the dish.

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