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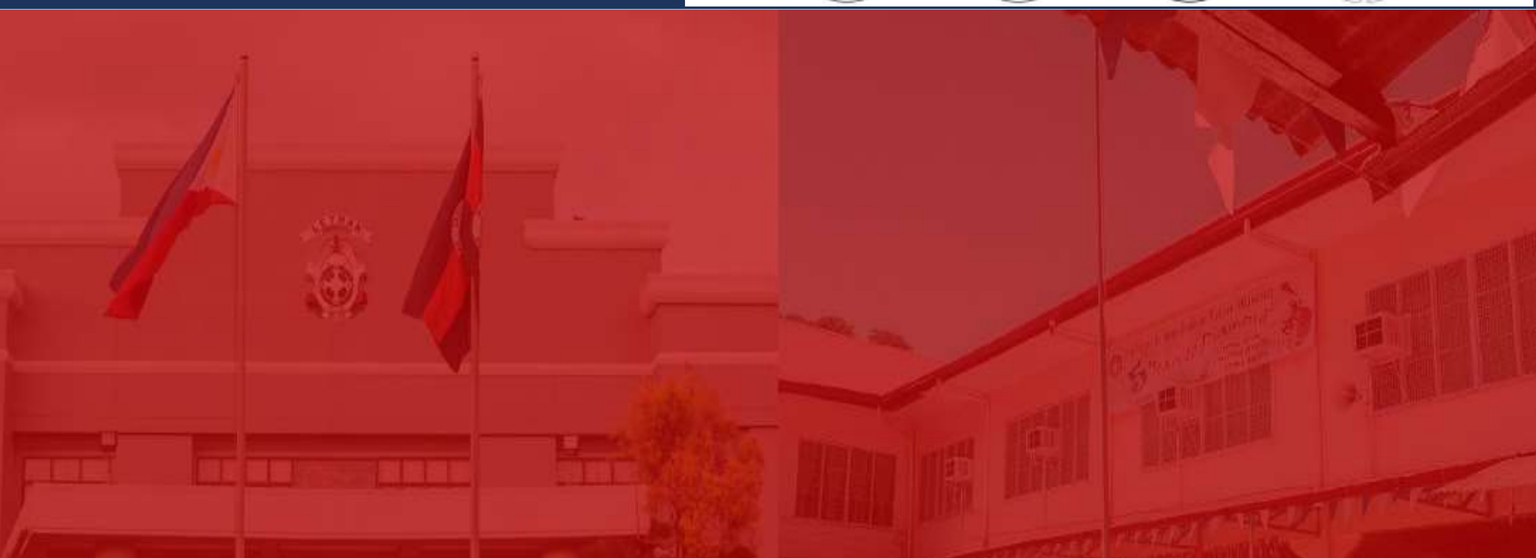

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SATISFACTION ATTRIBUTES AND SATISFACTION OF CUSTOMERS: THE CASE OF KOREAN RESTAURANTS IN BATAAN

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ABSTRACT

This study aims to assess how the selection attributes of customers may be evaluated in terms of facilities, menu, services, and food. The study determined the significant difference among the selection attributes of customers when group according to their profile. The relationship between the selection attributes and the overall customer satisfaction when dining in Korean restaurants in Bataan was also defined. The researcher gathered the data through a survey distributed among customers of the Korean restaurants in Bataan. The collection of data was analyzed using quantitative analysis. With the use of mean rating scale, feedbacks from the customers were measured. Similarly, Mann-Whitney U Test, Wilcoxon, The Kruskal Wallis Test, and Bonferroni were utilized to measure the significant difference, to test the relationship between selection attributes and customer satisfaction, the Spearman rho test was used. Findings revealed that when respondents were grouped based on their sex, age, educational level, occupation, income, Korean friends of colleagues, companion, and purpose have a significant difference in their selection attributes. The results also indicated that the selection attributes such as facilities, menu, service, and food have a strong positive correlation to the customers' overall satisfaction.

Keywords: *Korean Restaurants, Customer Satisfaction, Selection Attributes*

INTRODUCTION

In the Philippines, Korean restaurants are intended to cater to the Koreans but with the curiosity of Filipinos, they started to visit and love them. The Korean government saw this potential and planned to increase the number of Korean restaurants up to 40,000 overseas (Min, 2007). This plan will make it easier for the South Korean government to introduce their food culture, attract more customers, and increase their revisit intention (Hashimoto and Telfer, 2006; Nam and Lee, 2011; Seo, Jo-Phillips, Jang, and Kim, 2012, Tsai and Lu, 2012; Min K.-H., 2016). With the intensive efforts of these Korean restaurants, the local restaurants should continue to develop and intensify their marketing program.

According to the Department of Tourism (DOT) as of 2018, Koreans were still the top market for tourism with 22.3% of the total number of tourists and consistently topped as the biggest spenders amounting to Php 5.83 billion for February 2017 (DOT, 2018). The DOT launched its program in 2003 where English learning activities were combined with vacation trips; another DOT program is for the businessmen where the main attractions were beaches and golf. A lot of Korean students chose to study in the Philippines because of the English proficiency of Filipino professors. These programs were made possible because of the visa rules and direct flights from South Korea to the Philippines. Many Korean tourists decided to stay because of English-speaking Filipinos and the lower cost of living.

King Sejong Institute Foundation, the Korean government's unit that promotes Korean language and culture around the world assigned the Bataan Peninsula State University (BPSU) Balanga Campus as their partner to offer it for free. In return, the university offers English courses for Koreans with private student tutors. In 2011, a Korean company started to build their plant in Limay, Bataan which brought a lot of Koreans into the province (ABS-CBN News, 2011). The locals saw the opportunity in catering for these

Koreans and started their Korean restaurants near the plant and university.

This study was adopted in an Australian setting and focused on Korean Restaurants. The published studies available focused on the international cuisine as a whole and few specific cuisines like Japanese and Arabic. The findings of the study can be used by Korean restaurants to analyze and understand their market which will focus on their customers' needs and demands. The result of related studies was similar with the result of this study. The selection attributes showed a significant relationship with the satisfaction of the customers. The customers use the selection attributes as their standards in selecting their restaurants. (Kim, Suh, and Eves, 2010). When the customers are satisfied, it is predicted of revisit intention (Kim, Park, Kim, and Ryu, 2013). They focus on satisfaction and trust to build a relationship that will last and with good recommendation through word of mouth (Min, 2016; Ranaweera, 2003). The selection attribute is very influential for making choices that formed the customers' different preferences. (Min, 2016). The restaurant offers both service and products to their customers that they need to satisfy.

As shown in the research model below, differences in the selection attribute namely facilities, menu, service, and food were determined when customers are group based on their characteristics specifically, sex, age, educational level, occupation, monthly income, presence of Korean friend, frequency of visit, companion, and purpose of visit (arrow labeled H1-H9). Likewise, the relationship of the independent variable selection attributes (facilities, menu, service, and food) and the dependent variable overall customer satisfaction of customers was also evaluated.

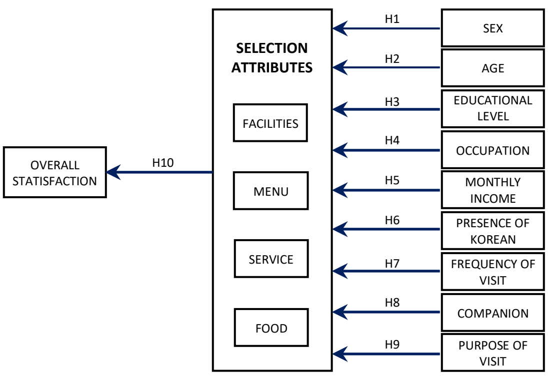

Figure 1: Research Model

This paper aimed to discuss the selection attributes and satisfaction of local customers in the advent of the proliferation of Korean Restaurants in the province of Bataan. Specifically, thi s study aimed to answer the following questions.

1. How may the profile of the respondents be described in terms of:
   1.1. Sex;
   1.2. Age;
   1.3. Level of education;
   1.4. Occupation;
   1.5. Income level;
   1.6. Presence of Korean friends or colleagues;
   1.7. Frequency;
   1.8. Companion;
   1.9. Purpose of visit
2. How may the selection attributes of customers be evaluated in terms of:
   2.1. Facilities
   2.2. Menu
   2.3. Services
   2.4. Food
3. Is there significant difference in the selection attributes for Korean restaurants when respondents are grouped according to profile?

H1: There is no significant difference in the selection attributes for Korean restaurants when respondents are grouped according to their profile.

H2: There is no significant relationship between selection attributes for Korean restaurants and overall satisfaction.

METHODOLOGY

Research Design

The research was descriptive and quantitative to identify the selection attributes and satisfaction of the customers. As explained by Ardales (2001), this method was designed to gather information about the present existing conditions to determine the nature of the condition that existed during the time of the research. An analysis of variance to reveal the Selection attributes of the Korean restaurant customers in terms of facility, menu, service, and food factor.

Participants of the study

The respondents were the customers of Korean restaurants in Bataan during lunch and dinner or customers who had experience in these restaurants. The researcher used G power to determine the number of respondents. Since the sample size is unknown, it was suggested that 327 respondents will be involved in the study. The table below presents the demographic profile of the respondents.

Table 1. Characteristics of Respondents

	Frequency of Age	Percentage
Age	18-25	52.6
	26-33	31.2
	34-41	10.1
	42-49	3.4
	50-57	2.8
Sex	Male	41.9
	Female	58.1
Highest Educational Level	High School	13.8
	College	82.6
	Masteral/Doctorate	3.7
Occupation	Employed	54.7
	Self-employed	11.6
	Unemployed	33.6
Individual Income	Up to 15,000	48
	15,001-30,000	41.3
	30,001-45,000	7.2
	45,001-60,000	3.1
	60,001 and above	0.3
Korean Friend/Colleague	Yes	30.3
	No	69.7
Visit in Korean Restaurant	1-2 times a week	11.3
	3-4 times a week	2
	1-2 times a month	28.4
	3-4 times a month	4.6
Main Companion	Rarely visit	55
	Family	29.4
	Relatives	3.1
	Friends	38.5
	Partner	19.9
	Colleague	9.2
Purpose of Visit	Dining a Meal	61.8
	Family Party	7.6
	Meeting friends / partner	25.1
	Business	5.5

Research Instrumentation

A survey questionnaire was used as the main instrument in the study. This survey questionnaire was lifted from a study in Australia by Min K.-H. in 2016 and asked the permission of the researcher to use the tool in this study. It is based on the DINESERV, a service quality tool used in restaurants. This tool was utilized to gather pertinent data in evaluating Selection attributes of the Korean restaurant customers in terms of facility, menu, service, and food factor. Every statement in the questionnaire was rated using the Likert Scale were a scale of 1 – 4. Each number has a corresponding equivalent: 1 as Strongly agree, 2 as Disagree, 3 as Agree, 4 as Strongly Agree.

Data Collection Procedure

The researcher sought permission from the restaurant managers before the distribution of the survey questionnaire. A formal letter noted by the researcher's adviser was distributed requesting permission to conduct a survey. Before floating the questionnaires, the researcher made sure that respondents voluntarily submitted themselves with consent as a participant of the study.

Data Analysis

For the study to draw valid inferences and generalizations, the gathered data were organized and treated with appropriate statistical computation using the Statistical Package for Social Sciences (SPSS). A coding manual was used in identifying the variables assigned to responses for each question. The data were tabulated and presented in tables. These data were analyzed and interpreted using statistical tools such as frequency counts and percentage distribution to describe the profiles of the participants; weighted mean to measure the ratings of the respondents. The weighted mean was used to represent measures in determining the perceptions of the respondents of the study.

The results were tested using the following statistical tests:

Mann-Whitney U Test – The Mann-Whitney U test is the nonparametric equivalent to the independent t-test and the appropriate analysis to compare differences that come from the same population when the dependent variable is ordinal (Leech, Barrett and Morgan, 2005).

Wilcoxon – The Wilcoxon signed-rank test is the nonparametric test equivalent to the dependent t-test. As the Wilcoxon signed-rank test does not assume normality in the data, it can be used when this assumption has been violated and the use of the dependent t-test is inappropriate (Lund and Lund, 2018).

The Kruskal Wallis Test – The Kruskal Wallis Test can be applied in the one-factor ANOVA case. It is a non-parametric test for the situation where the ANOVA normality assumptions may not apply. Although this test is for identical populations, it is designed to be sensitive to unequal means (NIST, 2015).

Spearman's Rho – It is the nonparametric version of Pearson R which measures the strength and direction of the association between two ranked variables (Laerd Statistics, 2018).

Bonferroni – It is a multiple-comparison post-hoc correction used for performing many independent or dependent statistical tests at the same time (Stephanie, 2015).

RESULTS AND DISCUSSION

The findings in facilities of the Korean Restaurants indicates that the facilities of Korean restaurants are also vital attributes in selecting Korean restaurants. Maintaining the working space for the customers and staff should be considered for better performance and satisfaction of the guests (Byun and Cho, 2006). Based on the result of the normality test, the data are non-normal. Therefore, the non-parametric statistical tool was used to test the significant difference in the section attributes of the participants when grouped according to their demographic profile. Kruskal Wallis and Mann-Whitney were utilized for the test of difference while spearman rho' was used to measure the relationship of the overall satisfaction and the selection attributes.

Table 2 shows that there is no significant difference in the selection attributes in terms of facilities and variable overall satisfaction when group based on sex. However, respondents have a different attitude in terms of menu, service, and food.

Table 2. Results of Mann-Whitney U and Wilcoxon tests to compare the selection attributes of the respondents based on Sex

	Sex	p-value	Remarks
Facilities	Male Female	0.072	No significant difference
Menu	Male Female	0.01	There is a significant difference
Service	Male Female	0.036	There is a significant difference
Food	Male Female	0.003	There is a significant difference
Overall Satisfaction	Male Female	0.509	No significant difference

The Kruskal-Wallis test revealed that there is a significant difference in the selection attributes of customers when grouped according to their age. These results indicated that when customers are grouped according to their age, their selection attributes and satisfaction varies.

Table 3. Test of difference in terms of the selected attributes among Age Group

	Age	p-value	Remarks
Facilities	18 – 25 26 – 33 34 -41 42 – 49 50 - 57	0.00	There is a significant difference
Menu	18 – 25 26 – 33 34 -41 42 – 49 50 - 57	0.00	There is a significant difference
Service	18 – 25 26 – 33 34 -41 42 – 49 50 - 57	0.00	There is a significant difference
Food	18 – 25 26 – 33 34 -41 42 – 49 50 - 57	0.00	There is a significant difference
Overall Satisfaction	18 – 25 26 – 33 34 -41 42 – 49 50 - 57	0.00	There is a significant difference

Kruskal-Wallis Post Hoc Test using pairwise comparison was used to identify where the significant difference in

Selection attributes when grouped according to Age. The food and service factors are important for younger customers while the price is important for older customers (Ramanathan, Di, and Ramanathan, 2016). The younger generations look for beautiful places and foods where they can capture their moment and post on their social media. They also need full attention while dining for their demands and requests compared to the older generations that they value more on the price and quality of their food.

Table 4 reveals that when customers are grouped according to their educational attainment, their considerations in choosing Korean restaurants differ. The customers with higher educational level are less satisfied because they have a higher income and expectations (Kelarijani, Jamshidi, Heidarian, and Khorshidi, 2014). They are exposed to good quality of service; therefore, they are not easily impressed. The customers with postgraduate level have the lowest satisfaction level because they have broader knowledge and think more critically and complex, so they are difficult to satisfy (Kristanti, Thio, Jokom, and Kartika, 2012). The customers with a lower level of education are easily impressed compared to those who graduated with a degree. Customers with higher education are more likely to have higher income compared to those with lower educational levels, therefore, they have more capability to afford and pay for better service. In addition, they are also more exposed to different restaurants. These customers are also aware and already understand the service they would receive. On this note, the restaurants should exert more effort and exceed their expectations to please them.

Table 4. Test of difference in terms of the selection attributes among Highest Educational Level Group

	Educational Level	p-value	Remarks
Facilities	High School College Masters/Doctorate	0.00	There is a significant difference
Menu	High School College Masters/Doctorate	0.0001	There is a significant difference
Service	High School College Masters/Doctorate	0.0007	There is a significant difference
Food	High School College Masters/Doctorate	0.041	There is a significant difference
Overall Satisfaction	High School College Masters/Doctorate	0.019	There is a significant difference

Table 5 indicates the results that grouping the respondents based on their occupation would indicate a significant difference in their selection attributes and overall satisfaction. Each group would have its preferences in choosing a Korean restaurant. The customers who rarely visit the restaurants are easier to please compared to the customers whose occupation are exposed in dining in the restaurants such as entrepreneurs who are likely to become the owners of the business (Kristanti, Thio, Jokom, and Kartika, 2012). The unemployed customers have a lower level of satisfaction compared to the employed and self-employed because they have higher standards. Employed customers are often exposed to dining in the restaurants same with the self-employed since these customers can start their own restaurants and more exposed to the quality of service. The self-employed customers are difficult to please since they are also giving their perfect quality service to their customers and these restaurants should exceed that level to satisfy them.

Table 5. Test of difference in terms of the selection attributes among Occupation Group

	Occupation	p-value	Remarks
Facilities	Employed Self-Employed Unemployed	0.00	There is a significant difference
Menu	High School College Masters/Doctorate	0.00	There is a significant difference
Service	High School College Masters/Doctorate	0.00	There is a significant difference
Food	High School College Masters/Doctorate	0.00	There is a significant difference
Overall Satisfaction	High School College Masters/Doctorate	0.00	There is a significant difference

In terms of grouping the respondents based on their monthly income, the results revealed significant differences in all variables, table 6. The price of the food is important to the customers in the lower-level income in contrast to the high-level income (Ramanathan, Di, and Ramanathan, 2016). The customers from the middle to a high-income level still choose to eat in the restaurants to enjoy the food and ambiance to relax and release their stress and their income level determines whether to dine in for well-priced meals. (Rozekhi et al., 2016).

Table 6. Test of difference in terms of selection attributes among Monthly Income Group

	Monthly Income	p-value	Remarks
Facilities	up to 15,000	0.00	There is a significant difference
	15,000-30,000		
	30,001-45,000		
	45001-60,000		
	above 60,000		
Menu	up to 15,000	0.00	There is a significant difference
	15,000-30,000		
	30,001-45,000		
	45001-60,000		
	above 60,000		
Service	up to 15,000	0.00	There is a significant difference
	15,000-30,000		
	30,001-45,000		
	45001-60,000		
	above 60,000		
Food	up to 15,000	0.00	There is a significant difference
	15,000-30,000		
	30,001-45,000		
	45001-60,000		
	above 60,000		
Overall Satisfaction	up to 15,000	0.00	There is a significant difference
	15,000-30,000		
	30,001-45,000		
	45001-60,000		
	above 60,000		

Table 7 shows that there is a significant difference in the selection attributes in terms of facilities when there is a Korean friend or colleague customers. The results revealed that respondents do have different preferences in their selection attributes when choosing Korean Restaurants to dine in.

Table 7. Results of Mann-Whitney U and Wilcoxon tests to compare the selection attributes of the respondents based on Korean Friend or Colleague

	Korean Friend	p-value	Remarks
Facilities	Yes	0.003	There is a significant difference
	No		
Menu	Yes	0.00	There is a significant difference
	No		
Service	Yes	0.00	There is a significant difference
	No		
Food	Yes	0.00	There is a significant difference
	No		
Overall Satisfaction	Yes	0.00	There is a significant difference
	No		

As shown in table 8, when respondents are grouped according to the frequency of visit, selection attributes in Korean restaurants differ in terms of service, food, and overall satisfaction. While in terms of facilities and menu, respondents most likely do have the same preference.

Table 8. Test of difference in terms of selection attributes among Frequency of Visit Group

	Frequency of Visit	p-value	Remarks
Facilities	1-2 times a week	0.106	There is a significant difference
	3-4 times a week		
	1-2 times a month		
	3-4 times a month		
	rarely visit		
Menu	1-2 times a week	0.074	There is a significant difference
	3-4 times a week		
	1-2 times a month		
	3-4 times a month		
	rarely visit		
Service	1-2 times a week	0.046	There is a significant difference
	3-4 times a week		
	1-2 times a month		
	3-4 times a month		
	rarely visit		
Food	1-2 times a week	0.01	There is a significant difference
	3-4 times a week		
	1-2 times a month		
	3-4 times a month		
	rarely visit		
Overall Satisfaction	1-2 times a week	0.01	There is a significant difference
	3-4 times a week		
	1-2 times a month		
	3-4 times a month		
	rarely visit		

Kruskal-Wallis Post Hoc Test using pairwise comparison was used to identify where the significant difference in Selection attributes when grouped according to the frequency of visit. The findings revealed that there is no significant difference in selection attributes and frequency of visit.

The results denote that when customers are grouped according to their companion, as shown on table 9, their restaurant choice differs. A theory confirmed that the customers do not stick to their diet rules when eating with someone or near someone who is overweight (Davis, 2018). Customers who are dining with their family, friends, and especially their partner tends to eat more. They became more comfortable and less likely to stick to their eating habits. They were also influenced by the kind of food that their companion is eating and to be expected to eat the same food.

Table 9. Test of difference in terms of selection attributes among Main Companion Group

	Main Companion	p-value	Remarks
Facilities	Family Relatives Friends Partner Colleague	0.00	There is a significant difference
Menu	Family Relatives Friends Partner Colleague	0.00	There is a significant difference
Service	Family Relatives Friends Partner Colleague	0.00	There is a significant difference
Food	Family Relatives Friends Partner Colleague	0.00	There is a significant difference
Overall Satisfaction	Family Relatives Friends Partner Colleague	0.002	There is a significant difference

Based on table 10, when respondents are grouped based on their purpose of visit, their selection attributes differ. Customers visit a restaurant for different purposes, but the reason is to get fueled (Wolf, 2010). When choosing a restaurant for their special occasion or business meetings or even dining for a meal it is very important to ensure that the venue will provide comfort because the wrong venue may lead to stress, hunger, discomfort, and poor decision making (Newlands, 2015).

Table 10. Test of difference in terms of selection attributes among Purpose of Visit

	Purpose of Visit	p-value	Remarks
Facilities	Dining Meal Family Party Meeting / Friend / Partner Business	0.00	There is a significant difference
Menu	Dining Meal Family Party Meeting / Friend / Partner Business	0.00	There is a significant difference
Service	Dining Meal Family Party Meeting / Friend / Partner Business	0.00	There is a significant difference
Food	Dining Meal Family Party Meeting / Friend / Partner Business	0.00	There is a significant difference
Overall Satisfaction	Dining Meal Family Party Meeting / Friend / Partner Business	0.002	There is a significant difference

Choosing a restaurant is crucial for the customers because it may lead them to satisfaction or dissatisfaction. Their purpose of the visit will determine which type of restaurants they should take. When dining for family gatherings it is important to have enough space for all the members, for business meetings a quiet place will be important to talk and close a deal same as meeting a partner if they want to relax and have a moment with each other.

The correlation coefficients exhibit a strong positive correlation. This indicates that as satisfaction with facilities, menu, service, and food increases the overall satisfaction also rises.

Table 11. Correlation of Selection Attributes to Overall Satisfaction

Selection Attributes	Overall Satisfaction	Strength of Correlation
Facilities	0.687**	Strong positive correlation
Menu	0.673**	Strong positive correlation
Service	0.731**	Strong positive correlation
Food	0.759**	Strong positive correlation

****Correlation is significant at the 0.01 level (2-tailed)**

CONCLUSION

Korean restaurants must compete with the home-grown restaurants and other food establishments which will require strategic and professional marketing to ensure effective management. Based on the evaluation of the respondents on the selection attributes of the customers towards Korean restaurants, it was clearly shown that all selection attributes are important factors in choosing Korean restaurants. These restaurants should continue to improve and market their unique, fresh, and sumptuous meals to please the customers. The result show that it is necessary to create restaurants with comfortable, accessible and clean facilities as well as variety in menu which offers unique, delicious, healthy and affordable food. Good service is also essential especially the communication skills and presentation of the staff. These restaurants should not only satisfy the hunger of their customers but also promote and inform them about the culture, tradition and other information about Korea. They can include pictures of tourist attractions on their walls, play Korean music and include Korean native displays that will make the customers feel the similarities of the facilities to the authentic restaurants in Korea. The staff may also look or wear uniforms that are in line with the unique features of Korea.

RECOMMENDATIONS

It is recommended that the restaurant should offer a wide variety of menus that may cater to children, young adults and adults as well as options for the people looking for healthier options that will suit their food choice based on their age. Korean food was known to be spicy but to suit the Filipino taste they may add options to their menu for the level of spiciness of their dishes to accommodate other customers who want to eat Korean food but can't tolerate the authentic level of spiciness. The restaurants may also offer special dishes for a limited time only to boosts the curiosity of the customers and act as a marketing strategy. They can also offer budget meals to cater to the customers who are in their budget, barkada meals can be also offered since a lot of customers were dining together with their friends and family. Restaurants offering samgyupsal may also allow solo customers to dine since this will be the new normal with the presence of the pandemic. Offering promos to boost the frequency of visits and increase the number of customers may be used.

Since the restaurants were near the universities and companies, they can also offer a business room or meeting rooms for friends for their privacy. This may also be used as a function room for family celebrations and gatherings since some of the customers were choosing Korean restaurants to celebrate their parties. For their facilities in the new normal because of the pandemic, the restaurants should follow the strict protocols given by the government for the safety of the customers and their staff. The seating capacity should be reduced to recommended quantity. Thermal scanners, foot baths, signage's, gentle reminders in their PA system and staff, availability of alcohol and sanitizers, shields in the counter areas as well as the disinfecting of the facilities and tables regularly and every after dining should be strictly monitored.

Training of the employees for better customer service and new protocols for the new normal may also be given to ensure safety but at the same time ensuring the quality of service to be given to the customers. Delivery options for the customers may also be available for those who will not be able to go out, but the restaurants should also be careful in delivering only fresh and quality food to their customers. They may also offer cashless transactions in the delivery, take out or dine in to limit the contact with each other preventing the possible transfer of the virus. Proper and complete PPE should also be provided for the staff and strict compliance for wearing of the mask of the customers before entering as well as temperature check and information details for contact tracing.

The restaurants should make efforts to improve the four selection attributes since there was a strong significant relationship between these attributes and the overall satisfaction of the customers. If they are satisfied, it will bring profit to the restaurants since the reaction of the satisfied customers are through their word of mouth and loyalty. They should focus on the taste, presentation, and freshness of the food they serve as well as train their staff continuously and continue to keep the whole restaurant clean and comfortable. The price should also be observed because it affects the satisfaction of the customers and their expectations of the facilities, service, and food that they will receive. They should also adapt to new marketing strategies to continuously meet the customers' needs and expectations and encourage loyalty.

Since there are significant differences in terms of sex, these restaurants should consider their differences and adjust their strategies based on the sex. Considering that the males are influenced by price, the restaurants should strategize their pricing and offer quality food at a reasonable price. Considering also that females tend to be more vocal and demand quality service, the restaurants should offer and focused on their service details. Sex differences should be acknowledged and addressed such as the difference in food preference, behavior, and satisfaction. Providing services and food that will cater to the preference of both sexes will be an advantage like offering competitive prices that the customers will be unable to negate. Both sexes have different needs and behavior to fulfill by the restaurants to ensure their loyalty. In terms of age, the younger customers are influenced by the food, presentation, and service.

The restaurants should offer well-presented meals that will impress the younger customers. Considering the older customers where their satisfaction is based on the price, the restaurants should ensure that the price is reasonable for its quality. They are also keen on the taste and health benefits that they will get so the restaurant management should consider adding healthier options to their menu. The level of the customer service should be elevated to satisfy the different expectation levels of the customers from their diverse income level and educational level. Inclusion of more variety and healthier food in the menu to address the need of the customers from different age group. Offering different menus for breakfast, lunch and dinner will also help the restaurant to cater to the customers' flexible schedule due to their work and provide them stress-free meals. Marketing through social media will also be beneficial to reach potential customers from different areas in Bataan.

The study may provide useful information for the Korean restaurants for further expansion of Korean food and suggests strategic marketing in targeting their customers. These will help the restaurants to allocate their resources to cater to the different needs of their customers based on their preferences. With proper allocation and focus to the needs, it will maximize the customers' satisfaction effectively.

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STATUS OF MANILA'S TOURISM AND FOOD ENTERPRISES IN TIME OF COVID-19 PANDEMIC

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ABSTRACT

The paper assessed the status of the local travel and food operators in time of COVID-19 pandemic in Manila. The assessment utilized the Pillars of New Normal taken from the identified implications of the study titled The Philippine Travel Survey Report: Insights on Filipino Traveler's Sentiments on the New Normal. (Tan, Drew (2020), Center for Tourism and Guide to the Philippines). The fundamental point of the study was to analyze the impact of COVID-19 pandemic to local travel and food enterprises in the city of Manila. This study can be a basis for regaining and adapting to the changes brought about by the COVID-19 pandemic. The study applied the qualitative descriptive research design which was used in gathering data that determined the status of Manila's tourism and food enterprises in time of COVID-19 pandemic.

Keywords: *Tourism, Food, Local Travel, Enterprises, COVID 19 Pandemic*

INTRODUCTION

Food and tourism are and have always been closely associated. Tourism is a social, cultural, and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. It seeks to explore the twentieth century development of food tourism, to trace origins, trends, and fashions in the symbiotic linkages between food production and tourism, and to find out more about the ways in which such relationships are formed. Hall suggested that for many years the understanding of the food tourism relationship was limited to the commercial provision of food for tourists in hotels, restaurants, and resorts. Hjalager and Richards in 2002 expanded on this proposition emphasizing the importance of place and locality; suggesting that 'gastronomic experiences are developed from aspects that are unique to, or only found in that region.

There is a vital role for food in broadening a destination's appeal; increasing visitor yield; enhancing visitor experience; strengthening regional identity; and stimulating growth in other sectors. Thus, food contributes to the overall sustainable competitiveness of a tourism destination (Devahli, Karwowski, Sonmez, Apostolopulos, 2020). The social and cultural significance of food in tourism have also gained recognition. As Jones and Jenkins quoted, "Food is now used as a means of developing new niche markets, supporting regional identities, developing quality tourism and sustainable tourism. Food has therefore developed from being a basic necessity for tourist consumption to being regarded as an essential element of regional culture" (Haven-Tang & Jones. 2006).

Sharples mentioned that "the media undoubtedly form a pervasive and invasive aspect of culture which has an enormous influence on destination and place image, as well as on taste." This, in effect, has 'lifted' food from the realms of functionality and hospitality and elevated cuisine in importance in today's western lifestyle, facilitating the transition of food and drink from a necessity to a status commodity (Hall, Mitchelle, & Sharples, 2008).

Manila serves as the center of culture, economy, education, and government in the Philippines. It is the most populous region of the country and one of the most densely populated in the world. It is also the main gateway for international travelers going to the Philippines by flights. When someone say "Manila," it can mean two things. First, it can refer to the City of Manila, the capital of the Philippines. Manila is made up of 16 administrative districts, which include Binondo, Ermita, Intramuros, Malate, and Quiapo, among others. Second, Manila is also referred to as greater Metropolitan Manila area. Manila is accessible from both international and local destinations by flights. Tourists land in one of the four terminals of Manila Airport, specifically in either Pasay City or Parañaque City, depending on the airline.

For first-time visitors in the Philippines, the best thing to do is to zero in on the famous historical places in Manila. A museum tour and a food tour should be on top of one's list of things to do in Manila. Whether it is history, food, culture, shopping, or nightlife, tourists will surely find something fun and unique to do in the metro. One of the best things to do for first-time travelers in Manila is to enjoy traditional Filipino cuisine and culture by patronizing dining establishments that offer a cultural experience. Manila is a foodie haven. There is no distinct cuisine that can best represent the region since Manila is a melting pot of multicultural lifestyle. Thanks to its diverse community, one can find cuisine from various areas of the Philippines. Binondo, established in 1594 is a vibrant and historic place to visit in Manila. It is the oldest Chinatown in the world. Like other Chinatowns, Binondo has bustling alleys filled with hole-in-the-wall joints, traditional bakeries, and budget-friendly streetside eateries, alongside family-style buffet Chinese restaurants.

Food tourism is inclusive. It includes the food carts and street vendors as much as the locals-only (gastro) pubs, dramatic wineries, or one-of-a-kind restaurants. To support the saying "the surest way to a man's heart is through his stomach," the Department of Tourism (DOT) under the leadership of Secretary Joseph Ace Durano recently launched Culinary Tourism dubbed as Kulinarya Filipina as part of the Cultural Tourism Program. This program hopes to introduce the Philippine flavors to domestic and international scene and aims to promote the country as a culinary destination.

Coronavirus (COVID-19) is an illness caused by a virus that can spread from person to person. The virus that causes COVID-19 is a new coronavirus that has spread throughout the world. COVID-19 symptoms can range from mild (or no symptoms) to severe illness. A novel coronavirus outbreak was first documented in Wuhan, Hubei Province, China in December 2019. The COVID-19 coronavirus pandemic has led to mass scientific conference cancellations, travel restrictions, social distancing, and other unprecedented prevention measures (Diebner, Silliman, Ungerman, Vancauwenberghe, 2020).

The tourism industry was one of the world's greatest markets; until the world met a pandemic in the 21st century, COVID-19. Without a doubt, the tourism industry is among the sectors that has been greatly affected by the COVID-19 pandemic. The closing of borders, airports, and hotels as well as restrictions on mass gatherings, land travel and related services across the world put around 100 to 120 million jobs at risk as estimated by the World Tourism Organization. In the first quarter of 2020, the period when the travel restrictions and lockdowns in most countries started, international tourist arrivals declined by 22% resulting in an estimated loss of US$80bn in global tourism receipts. In such period, 97 destinations have totally or partially closed their borders for tourists, 65 destinations have suspended international flights totally or partially, and 39 destinations were implementing the closing of borders i.e., banning the arrivals from specific countries (Lee, 2020).

In the Philippines, revenue from foreign arrivals for January to March 2020 plummeted to PHP 79.8 billion, a 40.62 percent decline compared to PHP 134.3 billion in the same quarter last year. The COVID-19 pandemic has caused massive disruptions in the world's airline, travel, and tourism industries. The government closed the airports in Luzon on 20 March as part of the Enhanced Community Quarantine (ECQ) that started in the island on 16 March. The tourism sector has already felt the negative impact of the pandemic on its performance much earlier. In other countries, travel restrictions and measures have started as early as January of this year and have impacted the Philippine international tourist arrivals. Domestic tourists, on the other hand, also limited their travel for fear of contracting COVID-19. The Department of Tourism reported that international tourist receipts in the first quarter of the year declined to PHP85bn, 36% lower than the revenues in the same period last year. One of the top questions leaders across the world have, is how to restart the tourism sector after COVID-19 pandemic.

As cited in the study of Steinmetz (2010), "In recent years food has gained recognition by governments, business, and academics as an integral part of the tourism product, and as a means of differentiation for destinations". There are many benefits to be had in linking food and tourism for all stakeholders concerned. Local food is a vital element that can help create a sense of 'place' and heighten destination appeal. Local produce adds authenticity to the tourist experience and provides motivation for visitors to come to a location. Tourists may even be tempted to stay longer in one place because of the availability of food products and related activities. Tourism provides an additional sales outlet for food producers and tourism-related spending on locally produced food products helps to stimulate and revitalize local economies. Increasingly, food is used in development initiatives to strengthen tourism destinations, and to create linkages of benefit to both the food production industry and the tourism industry (Steinmetz, 2010).

The Department of Tourism, in partnership with Guide to the Philippines and AIM- Dr. Andrew L. Tan Center for Tourism conducted a travel survey entitled The Philippine Travel Survey Report: Insights on Filipino Travelers' Sentiments on the New Normal. The survey aimed to help Tourism and Food enterprises as well as stakeholders identify the domestic travelers' sentiments and behavior that can be used as basis to craft strategies and plans for the new normal in travel and food enterprises. The salient findings of the survey were the Implications for Tourism Enterprises which were summarize under the following: Rebuild trust and confidence in travel, adapt products and services, Shift to digital and collaborate with stakeholders (Tan, & DOT, 2020).

In this study the abovementioned Implications were utilized to assess the status of the tourism and food enterprises in the City of Manila. It seeks to find out how tourism and food enterprises in the City of Manila adapt and prepare in the new normal in terms of travel and dining experiences (Tan, Andrew (2020), Philippine Travel Survey). In relation to study, idiographic approach is used since it is the most frequent form of attraction typology encountered in tourism research. The organizational perspective is a different research approach which does not necessarily examine the attractions themselves, but rather focuses on their spatial, capacity, and temporal nature. In this approach, attraction typologies are developed to reflect these qualities. Scale is the simplest basis for categorizing the spatial character of an attraction within an organizational perspective. Scale considerations can provide insight into the organization of tourist attractions, their relationship to other attractions, and the relationship of attraction images to attractions themselves. These considerations are important in the planning and marketing of tourism (Lew, 1987).

METHODOLOGY

In this study the researchers employed the qualitative descriptive research design. The goal of qualitative descriptive studies is a comprehensive summarization, in everyday terms, of specific events experienced by individuals or groups of individuals. The researchers made use of structured interview questions adapted from the implications for tourism enterprises in the study of Tan in 2020.

Interview Questions

The following interview questions guided the study.

Implications for Food/Tourism Enterprises

I. Rebuild Trust and Confidence in Travel

What adjustments will I make to endure the safety of customers/travelers?

How can I improve my customers' experience given the dining/travel requirements?

II. Adapt Products and Services

How am I monitoring shifts in dining/ travel behavior?

How can I tweak my products /services to changing dining/traveler preferences (e.g preferences for activities that limit exposure to crowds)?

III. Shift to Digital

What customer touchpoints do I need to digitize?

How can I establish diners'/traveler's confidence in online transactions?

IV. Collaborate with Stakeholders

How can I seek convergence points with stakeholders of local food/tourism establishment?

Source: Philippine Travel Survey Report (June, 2020) Joint project of Department of Tourism-Philippines, AIM-Dr. Andrew L. Tan Center for Tourism and Guide to the Philippines.

Limited number of travel and food enterprises were in operations during the collection of data, since Manila was placed under enhanced community quarantine. Therefore, purposive sampling technique was employed. Only those travel and food enterprises that were in operations and with key informants who were willing to participate were included in the study. There were ten travel agencies and ten food establishments that participated in the study.

Coding and Themes

Table 1. Food Enterprise (Restaurant/Café/Dining Establishment)

Code	Establishment	No. of Years of Established	Participant
1	Restaurant		Head Waiter
2	Cafe	4.5 years	Administrative Officer
3	Restaurant	29 years	President
4	Restaurant	1 year	Owner
5	Cafe	5 months	Operations Head
6	Cafe	1 year	Manager
7	Chinese Restaurant	11 years	Head Cashier
8	Cafe	2 years	Shift Supervisor
9	Seafoods Restaurant	13 years	Dining Manager
10	Tea House	13 years	Supervisor

Table 2. Travel Enterprise

Code	Establishment	No. of Years of Established	Participant
11	Travel Agency	50 years	Reservation Officer
12	Tourist Travel Transport Service	2 years	Operations Head
13	Museum	38 years	Complex Manager
14	Travel Agency	10 years	Operations Manager
15	Tourist Destination	4i1 years	Researcher
16	Travel Agency	4 years	General Manager
17	Travel Agency	22 years	
18	Travel Agency	5 years	General Manager
19	Travel Agency	30 years	Sales Officer
20	Travel Agency	6 years	Chief of Processing Division

Data Analysis

Data analysis of qualitative descriptive research is unlike other qualitative approaches. This data analysis does not use a pre-existing set of rules that have been generated from the philosophical or epistemological stance of the discipline that created the specific qualitative research approach. Rather, qualitative descriptive research is purely data-derived in that codes are generated from the data in the course of the study. Like other qualitative research approaches, qualitative descriptive studies generally are characterized by simultaneous data collection and analysis (Lambert et. al, 2012).

RESULTS AND DISCUSSION

Implication I

Rebuilding Trust and Confidence. As stated in the joint survey of Tan and DOT (2020) rebuilding trust and confidence is described as inspiring trust and confidence in the safety of travel and should be the main priority for tourism enterprises.

Category 1: Ensuring Safety of Clients. This category appeared through asking key informants from both food and travel enterprises on what adjustments will they make to ensure the safety of customers/travelers? As per World Health Organization (2020) guidelines specified that businesses to remain safe from virus contamination the main priority is to keep the virus out of the environment. Several key measures are required including upgrading of cleaning and sanitation measures, disinfecting surfaces and high-touch points, educating staff on the virus and how to protect themselves and others, reinforcing protocols such as physical distancing, hand washing, and improved security with people staying in their vehicles/sanitizing hands when handing out documents and other material. This leads to the finding of two themes which are compliance with health and safety protocols and modified service operations.

Compliance with Health and Safety Protocols. Most participants noted that upon the government instructions all areas of the enterprises (1) started to be sterilized and periodic application of deep disinfection; (2) checked body temperatures of all the customers who are visiting; (3) observed social distancing; (4) mandatory use of face masks and face shields; (5) wearing of personal protective equipment (PPE); and (6) compliance in travel requirements.

Participant 18 stressed that it is important that the travel enterprises inform and explain to the clients the needed travel requirements such as RT-PCR when choosing a travel destination.

Participant 5 shared that the City Government of Manila requires employees of food enterprises to undergo testing in the accredited COVID-19 testing centers.

In reference to hygiene and sanitation, participant 10 provided this response

> "Yes. Complete hygiene and sanitation materials and equipment in our store. Using temperature check, declaration form from supplier, employees and customers is a must. Foot mat was also provided in the store. If the employees report for work and exceeded in 37 temperature, they will have to proceed to designated clinic of the store."

Participant 1 emphasized

> "This is even more significant today, as ensuring safety of customers is indispensable in the management of pandemic."

In the study of Bagner et. al (2020) which investigated the impact of COVID-19 on hotel operations, emphasized takeout or delivery options to reduce public dining; to implement intensified cleaning/sanitizing protocols, use of personal protective equipment (PPE), and accentuate personal hygiene to workers; properly communicate new COVID-19 policies to guests and employees; implement physical distancing practices and implementing protocols for guest exposed to or infected by COVID-19.

Modified Service Operations. Participants 3 and 20 stated, aside from compliance with health and safety protocols they gradually opened their food enterprise for takeout service in accordance with DTI Memorandum Circular 20-52 for dining/restaurants stating that establishments are encouraged to conduct delivery and takeout only during Enhanced Community Quarantine and Modified Enhanced Community Quarantine. Whereas respondent 20 declared that they did not allow walk-in clients as much as possible and connected via online or call only.

In reference to client capacity limitation, participant 8 provided this response

> "We are following safety protocols in our store as imposed by the DOH and government such as practicing social distancing which led to re-arrangement of tables and chairs, putting barriers for table, sanitizing every 30 minutes and taking temperature of customers before entering the store".

In addition, participant 16 imparted

> "We focus on online transactions where our staff were observing work from home scheme."

Participant 17 shared

> "We applied shifting schedule of our staff and limit the capacity of our office. We preferred more online transactions in asking inquiries or assisting our clients."

Participant 5 stated,

> "Outdoor seating was offered, and we do takeout service."

Participant 10 uttered

> "Since then, we shifted into take-out orders, we tied up with some delivery companies such as Food Panda and we created our own online application orders and social media site such as, Booty application."

The study of Jain, S. (2020) recommended series of actions for restaurants to attract customers in the post-covid-19 period, these are: (a) inclusion of island-sitting arrangements to assure maximum physical distances between people; (b) provide actual cooking counters to allow customers to watch their food being prepared; and c. instill confidence in its safety and have appropriate hygiene and cleaning procedures.

Category 2: Improving Customer's Experience. Given the dining and travel requirements. The category was in evidence when the respondents answered the question, how can I improve my customer's experience given the dining and travel requirements? COVID-19 pandemic has devastated lives and livelihood around the globe. Food and travel enterprises was forced to rethink of what customer care means. Assessment of customer journeys and satisfaction measurements have given way to an acute urgency to address what they need (Diebner et. Al ,2020). This assessment directs to the conceptualization of these themes which are quality customer service and ensuring the health and safety of client and staff.

Quality Customer Service. Participants specified that to ensure quality customer service, aside from wearing the PPE which hinders proper communication, staffs verify orders repeatedly and conduct short but meaningful conversations.

The following participants shared overall statements to satisfy customers and provide them with convenience.

Participant 5 shared

> "Create relaxing ambiance, limited dining capacity, and convenient operation hours".

Participant 1 said

> "Measure the customer experience at every point. Optimize customer journey and increase satisfaction."

Participant 6 also declared

> "We implement advanced booking in our café to avoid long queues."

Participant 16 also stated

> "Providing assistance in accomplishing their travel requirements as well as refund/rebooking of travels."

While participant 14 specified

> "Recommend to our client the best destination that they can enjoy in spite the pandemic."

Whereas participant 20 shared

> "We make sure that upon arriving in their desired destination, we do everything, and all the requirements are already prepared for the clients."

Ensuring Client and Staff Health and Safety. Three out of the twenty participants responded to the theme as follows during the pandemic; sitting dining capacity was decreased to observe social distancing and apply broken time in operating schedules to give time in store cleaning and sanitation.

Participant 19 specified that aside from following the safety protocols they also provide hygiene kits to their guests. Participant 12 also adheres to safety protocols such as taking the client's body temperature, filling-out health declaration form and wearing of PPEs of employees are strictly implemented. While participant 13 makes use of QR code in lieu of the mandatory medical declaration.

The section showed that during the COVID 19 pandemic both food and travel enterprises as stated by the participants focus on re- designing guidelines in operations to comply to the government requirements. Furthermore, the participants were able to offer new customer experiences and be concerned about safety.

Devahli, et al (2020) mentioned in their study the specific steps for an exit strategy and the reopening of activities in different business sectors as presented by Peterson et al (2020). Primary steps include implementing widespread COVID-19 testing, having enough PPE supply, lifting social distancing and mobility restrictions, using electronic surveillance, and implementing strategies to decrease workplace transmission. Emphasis was placed on the daily screening of hospitality sector staff for COVID-19 by using real-time reverse transcription-polymerase chain reaction or serology tests.

Implication II

Adapt Products and Services. All enterprises in the travel value chain must continually probe shifting travel behaviors and adapt their offerings based on the changing demands (Tan and DOT, 2020).

Category 1: Monitoring Shifts in Dining/Travel Behavior. The category was evident when the participants responded in the question: How am I monitoring shifts in dining/travel behavior? The shift in demand patterns was dramatic during the pandemic. According to McKinsey Survey across cities in China in February 2020 overall penetration increased by 15 – 20 %. E-commerce sales for consumer products in Italy soared by 81 percent in a single week. (Bertoletti, 2020) All of the Key Informants stated that to keep them abreast of their clients dining and travel behaviors, news and social media platforms played a significant role.

The essences derived from the interviews include participant 20 which stated,

> "We make it sure that we are informed by reading articles online or watching news.

Also, participant 15 declared

> "We monitor news via social media on a daily basis."

Category 2: Unique Customer Experience. This category emerged when the participants were asked: How can I tweak my products/services to the changing dining/travel preferences (e.g., preferences for activities that limit exposure to crowd)? Tan (2020) conveyed that all enterprises in the value chain must continually probe shifting travel behaviors and adapt their offerings based on the changing demands.

Participant 6 said

> "We established the site of our store at the back of Manila Cathedral which serves as a beautiful background whenever our customers will take pictures in our café; it became Instagramable because of that."

Participant 12 stated

> "It is more practical to avail our products which leads to traveler's satisfaction and at the same can make our client's healthier and safe from virus since one is to one in riding a bicycle."

Participant 19 disclosed

> "Create intimate travel packages and support local tourism."

Participant 16 also said

> "We focus more on local tour packages and airline ticketing which is more income generating in this time of pandemic."

The descriptions presented above suggested that in the new normal, customary offerings are inadequate. Enterprises should take steps rapidly and innovate in the delivery model of their products and services to cope in the changing demands of the consumers.

Wen et al. (2020) reviewed literature and news on Chinese tourist behavior, tourism marketing, and tourism management; they concluded, the growing popularity of luxury trips, free and independent travel, and medical and wellness tourism post-COVID-19 period. They also indicated that new forms of tourism would be more prevalent in post-COVID-19, including: (1) slow tourism, which emphasizes local destinations and longer lengths of stay; and (2) SMART tourism, which uses data analytics to improve tourists' experiences.

Implication III

Shift to Digital. Online visibility is a necessary condition to thrive in the new normal. (Tan, 2020)

Category 1: Digital Touchpoints. A touchpoint can be defined as any way a consumer can interact with a business, whether it be person-to-person, through a website, an app, or any form of communication ("Touchpoint Glossary", n.d.). Whereas digital touchpoints are those online and mobile interactions where consumers engage with a business. It includes interactions across different devices, from smartphones to mobile tablets, and various channels including social media and websites. (https://study.com/academy/lesson/digital-customer-touchpoints-definition-examples.html#). The category was obtained from the gathered definitions and after the participants responded to this query, "What customer touchpoints do I need to digitize?" The themes derived during the interview can be classified into Online Transactions and Maximizing Digital/Marketing and Promotion.

Online Transactions. Seven out of twenty participants reveal that online transaction was their frequently utilized customer touchpoint during the Covid 19 Pandemic.

Participants 1, 3, 7, 9 and 10 stated that they apply cashless payments such as Debit, Credit card, Paymaya and Gcash. The customers can order foods through online or landline phones. For participant 3, aside from online transaction they also do online purchase of stocks.

Participant 6 stated

> "Online reservation/booking and cashless payments."

In addition, according to participant 6

> "We ensure that every customer specially every time they visit our store as well as following health protocols that keep our employees and customers safe. For example, all card transactions are barcode ready for scanning to limit contact to customers."

Maximizing Digital Marketing and Promotion. Most respondents use their digital touchpoints in marketing and promotion of the enterprises to entice technology savvy customers.

Participant 2 shared:

> "In this time of pandemic, the safety and welfare of everyone must be on the first line. In view of this, I think one aspect that should be digitized will be the food/menu and its availability to the prospected customers. For them to be able to choose an array of different menus through an online website on a certain page for them to inquire price, promos and discounts. It enables more sustainable customer interaction which turn results in better service."

Nine among of the ten participants from the Travel Enterprise group reveal that social media accounts such as Facebook page, Email, Instagram, Twitter, You Tube and Marketa.com are the most used hub in marketing and promotion of their enterprise. This was supported by participant 7 who declared that

> "Active monitoring of Facebook account page can accommodate inquiries of clients/guests."

Participant 2 also indicated

> "By simply through informative and detailed information into the services, food and any related aspects that you mainly cater on. The social media presence also means more people will be reached out."

Participant 1 said

> "Provide value content through Facebook and Twitter to expand conversation with our customers."

In connection participant 8 shared

> "Since we are a lean store, we keep our social media postings consistent every week via Facebook and shared by our friends to drive more sales. We mostly post our new product line up to inform our market."

Participant 6 point out

> "Social media is very powerful especially if our customers are taking their selfies or pictures in our store. We actually became known because of social media."

Social Media Boosting as suggested by participant 4, participant 15 and 20 was utilized to allow advertisements to be more prominent across the entire Facebook platform. Participant 13 stated that they shifted to digitalized door processing portal in the main entrance of the enterprise to promote safety for both clients and employees as well as ease in guest's admission. Participants 9, 12, 18 and 19 manage regular posting of updated news, products, and services that they offer in the social media platforms to communicate to their clients.

Category 2: Building Trust and Confidence in Online Transactions. This category emerged through asking the participant, "How they establish diners'/traveler's confidence in online transactions?" According to Atif (2002) building confidence in e-commerce requires more than robust processing systems. The human perception of trust is a core ingredient in any online transaction and future e-commerce system must support trust services to gain loyalty at both the consumer and provider ends.

Building clients' trust and confidence. When asked, "How can they establish clients' confidence in online transactions?" participant 4 stated

> "Faster transaction thru digital process/tech know-how of staff provides easier communication or clear instruction for customers."

In addition, participants 6, 7, 16 and 18 declared

> "More efficient, effective and safer than the usual/traditional transaction of payment and taking orders."

Participants 2 and 20 suggested

> "There should be always any proof of every successful transaction and it should be more accessible at any times."

Participant 12 recommended

> "Advanced booking/reservation is more efficient so that they will not be in queue and wait for a long time. When they arrive, they can immediately ride/rent the bicycle."

Participant 15 emphasized confidentiality, privacy, and timeliness in response. Participant 13 shared that

> "continuous and sustainable implementation and monitoring per online transaction with performance evaluation and or feedback evaluation for the satisfaction of travelers."

Lastly, participant 14 assured clients of legitimacy through feedbacks and reviews from their loyal customers via the Facebook page.

In this trying time, customers need extra information, guidance, and support to navigate an unusual set of challenges, from safety to working from home and to helping kids to learn when face to face learning is not viable. Trusted and socially responsible enterprises that strongly rely on creative use of technology to help consumers get through the pandemic safely will establish a strong advantage.

Implication IV

Collaborate with Stake Holders. Tan (2020) stated that stakeholders need to strengthen their coordination mechanisms with particular attention given to the most vulnerable destinations and segments of the industry.

Category 1: Convergence points with Stakeholders. The category transpired when participants were asked how to seek convergence points with stakeholders of local food and tourism enterprises. Per recommendation of Tan (2020) collaboration among tourism stakeholders is critical to the success of tourism recovery. The descriptions provided by the participants lead to the discovery of two themes: a. stakeholders' cooperation to strictly comply with health and safety protocols; and b. stakeholders' engagement and partnership.

Stakeholders' cooperation to strictly comply with health and safety protocols. Six participants agreed that strictly following the COVID-19 protocol and adhere to the Inter-Agency Task Force on Emerging Infectious Diseases (IATF) mandate, will standardize health protocols in food and tourism enterprises.

Stakeholders' engagement and partnership. Participant 5 said that engaging in trade events and other similar activities can enhanced local partnership among enterprises. In addition, participant 3 and 9 stated

> "The City of Manila municipal licenses office called us to join in the Manila Restaurant Week held in Manila Hotel last December 2020. Through this event the restaurant became known to other people and social media."

Participant 17 said

> "Actively participating in the survey conducted by the DOT and joining in travel expo that will be organized by PTAA this coming May 2021 to boost local tourism. In connection, Travel B and D Key Informants suggested "Helping the local tourism by encouraging travelers to travel or make sightseeing in Intramuros."

Participant 13 stated that

> "Proper individual coordination per stakeholder through regular zoom meeting to tackle immediate concerns."

The descriptions presented above the COVID-19 pandemic shifted both food and tourism enterprises in the new perspective and require the thorough needs assessment, benchmarking, and joint consultations of various stakeholders for the industry to build long term-relationship.

As stated in the UNWTO Secretary-General's Policy Brief on Tourism and COVID 19, a roadmap to transform tourism needs to address five priority areas: (1) Mitigate socio-economic impacts on livelihoods, particularly women's employment and economic security; (2) Boost competitiveness and build resilience, through economic diversification, with promotion of domestic and regional tourism where possible and facilitation of conducive business environment for micro, small and medium enterprises (MSMEs); (3) Promote advance innovation and digital transformation of tourism, including promotion of innovation and investment in digital skills, particularly for workers temporarily without jobs and for job seekers; (4) Foster sustainability and green growth to shift towards a resilient, competitive, resource efficient and carbon-neutral tourism sector.; and (5) Coordinate and build partnerships to restart and transform sector towards achieving Sustainable Development Goals.

IMPLICATIONS

Rebuilding trust and confidence by providing safety standards required by the government is a must to food and travel enterprises. Food and travel enterprises offer ingenious support and care for customers and employees not only to continuously operate but to encourage positive relationships that guaranteed to last long after the crisis has ended.

Food and travel enterprises were prompt in innovating to redesign operations and services considering the changes in customer preferences and were able to provide customers' needs in this time of crisis.

The pandemic shifted the customers behavior that leads to changing the demand patterns of food and travel services. Most enterprises were very prompt in collecting information via social media to understand the customers. Travel and food enterprises developed modes of services and offerings with unique experiences but still promotes protection from acquiring the virus.

Travel and food enterprises adapted to online transactions and maximized digital marketing and promotion using digital touchpoints. In building trust and confidence in online transactions Travel and food enterprises focus on efficiency of services by fast transactions and issuance of proof of payment as well as confidentiality.

Stakeholders of travel and food enterprises seek cooperation in strict compliance of the health and safety protocols. They also emphasized exclusive and regular engagement and partnerships with local government for needs assessment, benchmarking, and joint consultations.

RECOMMENDATIONS

Food and travel enterprises must continuously design customer experiences in the environs of health and safety, enhance health and safety protocols that may come as concerns to customers, and focus on care and connection to ease any apprehensions brought about by the pandemic.

Travel and food enterprises should reassess and recalibrate their company purpose and values in the industry considering the changes in customer behaviors during this time of pandemic.

Search and invest in the growing number of available online marketplaces to expand digital reach. The travel and food enterprises should also maximize the use of social media platforms to create a communication strategy that can optimize marketing and promotions. Digitalization of transactions and booking/reservation is one of the key tools to survive the business in time of pandemic.

Travel and food Enterprises should continue to be involved with other stakeholders such as, local community and local agencies and focus on discussions about health, safety, and sustainability.

Since the study was conducted during the heightened alert of the enhanced community quarantine because of COVID-19 pandemic, selection of the food and tourism enterprises that were included was limited to those that were in operations. Therefore, the researchers recommend an in - depth study that will examine and understand more the tourism and food enterprises shareholders' lived and perceived COVID-19 experiences to understand and act providently to the pandemic. Further research is also highly recommended since the study revealed that the nature and degree of crises-led transformations depend on whether and how shareholders are affected by how they respond and reflect on crises.

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ASSESSMENT OF THE COMPETENCIES OF LETRAN MANILA LIBRARIANS IN DEVELOPING RESEARCH GUIDES

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ABSTRACT

The study used a mixed-method Sequential Exploratory Design which measured the competency level of Letran Manila librarians in developing Research Guides. Findings revealed that the competency level of librarians has greatly increased after being subjected to the Research Guide Development Project. Likewise, librarians still need to undergo training that focuses on skills with an equivalent "skilled" level of proficiency rating. Librarians have always been a significant link in molding the subject expertise of students. Librarians assumed such a role by taking part in the learning process of every library user, by providing reference assistance and access to all various sources (Hartsell-Gundy, 2012). Conclusively, librarians are skillful in developing Research Guides, however, most of them had difficulties achieving their current proficiency level. Aside from engaging in training and seminars, librarians must adhere to the original cycle of the Research Guide Development Project highlighting the participation of Program Coordinators to improve familiarity with the Colegio's curricular programs. Collaboration with faculty members in integrating Research Guides into the Learning Management System (LMS) may increase the utilization of Research Guides and may also improve the librarians' marketing skills.

Keywords: *Research Guides, Librarian Competencies, Assessment*

INTRODUCTION

The COVID-19 pandemic has greatly affected educational institutions worldwide, it forced several educational institutions to near-total closures. To counteract the effects of the pandemic, educators everywhere are seeking ways to make education remotely available. Karthik (2020) provides a clear view of the said novel means:

> "In response to the current situation, educators have been instrumental in finding new ways to ensure learning continues for [students] by developing online and offline learning materials; learning about the working of video conferencing tools to be able to meet students regularly and conducting mental & social well-being sessions during the start of the school day and at closure."

To support the academic requirements of remote education initiatives, educators and students are now heavily utilizing information resources that are freely available on the internet. (Reimers, Schleicher, Saavedra,2020)

Relying solely on free internet resources is not enough to meet the intended educational outcomes. The need for resources that were developed specifically to support curriculum and pedagogy is still very vital to achieve quality education. For this reason, librarians around the world of all types have been working hard to provide access to collections and services remotely. (Kumar & Khode, 2004)

Librarians have always been a significant link in molding the subject expertise of students. Librarians assumed such a role by taking part in the learning process of every library user, by providing reference assistance and access to all various sources (Hartsell-Gundy, 2012). Since Librarians are equipped with skills and expertise in providing resources that are suited in an online educational setting (Sasso, 2016), the remote learning initiatives nowadays never become a factor to hinder the library from providing optimum services. One of the best solutions devised by librarians to promote and enable virtual access to the library would be through the development of "online research guides".

Different names were associated with research guides, such as pathfinders, subject guides, and course guides, all these are tailored parts of library resources used by library users. (Sinkinson, Alexander, Kahn, Hicks, 2012). These guides were designed to provide the precise information that the researcher desires. Research guides also contain instructions and other vital information to accomplish a research task. (Puckett, 2015).

The clamor for Research Guides began in the 1970s, 51 years after its conception, its purpose, and function are still the same. Subject specialists developed these research guides to lead researchers to information sources regardless of media format (Tshetsha, 2019). Patricia Knapp, a staff member of the Model Library Project of Project Intrex of the Massachusetts Institute of Technology is considered the inventor of Research Guides. Back then, Pathfinder was its original name. Knapp devised it to teach students to "find a path" appropriate to their library's organization. According to Canfield (1972), Patricia Knapp's original intention for pathfinders is to function as a step-by-step, point-of-need reference, and instructional tool that supports the first three-five hours of research. Its contents were originally arranged in a single 8.5 x 11-inch sheet of paper.

Nowadays, Research Guides have dramatically evolved from printed handouts or booklets to a full-scale online resource directory. The interest for such guides grew exponentially, it is a unique research tool that many authors find intriguing, some articles closely examine research guides, examining their history as well as major trends. Emanuel (2013) provided the outlined historical accounts of Pathfinders, from the printed bibliographies of the 19th century to the sophisticated online research guides of today that utilize online platforms such as LibGuides, SubjectsPlus, and Library a La Carte.

In the international library scene, particularly in western countries, developing research guides is already a staple task for librarians. But the practice of using printed guides or even the use of website integrated in-house directories are no longer utilized. Western librarians already advocate the use of proprietary platforms such as Libguides to develop such guides, which is considered the most popular web publishing and content curation platform for libraries today. To date, according to the Springshare website, the Libguides platform is already being utilized by 201,597 Librarians from 5,599 institutions worldwide.

In the Philippines, research guide development has become one of the paramount service offerings of libraries. The sudden interest in research guides was triggered by the growing needs of online learning initiatives of educational institutions. Most local research guides were made accessible via downloadable PDF documents and are commonly stored within cloud-based storage solutions such as google drive or Microsoft OneDrive. To date, only DLSU Libraries and the College of Saint Benilde's Br. Fidelis Leddy Learning Resource Center, utilize the Libguides platform in developing research guides.

Last August 11, 2020, Colegio de San Juan de Letran, Manila launched its research guides, which were made available via the Letran webpage. The guiding principles that kept the project on track are as follows:

1. To support the virtual education initiatives of the Colegio
2. To increase the utilization of all the information resources of the library (Due to the Covid19 Pandemic, the project will only focus on curating online information resources.)
3. To develop the subject expertise of librarians. The project will serve as a training ground for Subject Librarianship.

The project was conceptualized last May 1 to 16, 2020 by a 3-man team. During the conceptualization phase, the project proponents used google suite applications to prepare the procedural manual and the other requirements of the project. A trial and training phase was made after the approval of the project, which lasted for almost 4 months. The said phase allowed librarians to master the research guide development process and learn the required set of skills.

To ensure that the project produces only the best output, Letran librarians were divided and given several project roles, each role has its own set of responsibilities to focus on during the development of research guides. This is further described in table 1.

Table 1. Project Roles

Role	Responsibility
Research Guide Coordinator	– Distribution of subjects for Research Guide Development – Evaluation of resources selected by Subject Librarians. – Provides coaching and mentorship to Subject Librarians. – First level Quality Control of Research Guides – Monitoring of Research Guide utilization
Subject Librarian	– Content curation of information resources related to subjects for research guide development
Layout Coordinator	– Development of the final layout of Research Guides – Development of promotional e-posters
FB Page Admin / Library Systems Administrator	– Promotion of research guides to the Library FB page – Promotion of Research Guides to the webpage of the Colegio

Furthermore, the research guide project follows a development paradigm that further promotes quality and excellence in the output to be produced.

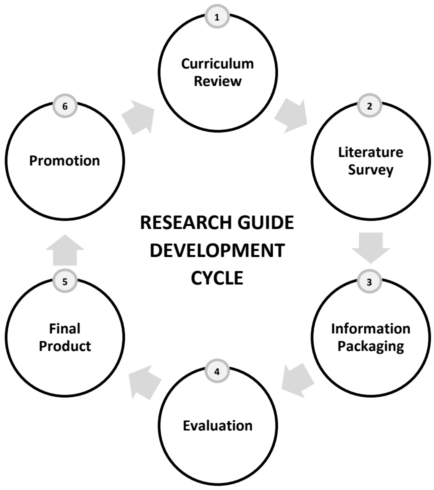

Figure 1. Research Guide Development paradigm

Figure 2 illustrates the paradigm of the entire Research Guide Project, which showcases 6 interconnected stages. Stage 1 is Curriculum review; in this stage Subject Librarians will review the syllabus and CHED CMO of the subject scheduled for research guide development. The review will be the basis in performing Stage 2: Literature Survey, which is all about locating relevant information resources. Subject Librarians will explore resources available in the library and on the open web. On the other hand, stage 3 involves forging all the available information resources into one promotional product: e-Research Guides. Under this stage, the Research Guide Coordinator will closely collaborate with the other coordinators of the project.

Under stage 4: Evaluation, the developed research guides will undergo 2 levels of quality control measures, to be performed in sequence by the following: 1. Research Guide Coordinator, 2. Chief Librarian. The result of the evaluation will be the basis for developing the final version of the Research Guide (Stage 5: Final Product).

Finally Stage 6: Promotion, involves marketing the Research Guide on two web platforms: the Letran Website and the Library Facebook Page. In this stage, the participation of the LISTEN department is very vital.

But the development of research guides does not end at stage 6, for after a year of web publication; the developed research guide will be revisited and updated, hence the protocols applied to stage 1 to 6 will again be repeated (Research guide development is an infinite cycle of developing and updating)

Present Study

Competencies are considered as the compendium of knowledge, skills, and attitudes to efficiently perform a task. Having upskilled competencies are vital to pursue personal growth and for an institution to thrive (Okoye, 2013)

Maintaining a certain level of proficiency in performing certain tasks is very vital to produce outputs that meet end-user expectations. In the realm of librarianship, the changing landscape of information and information technology and services requires a certain level of competency from library professionals. The challenging information and research landscape of universities require diverse competencies in information professionals (Farooq, et. al.,2016). Likewise, the librarians need to increase learners' competencies and knowledge through the services and resources that they are providing (Corbet, Brown, 2015).

One of the responsibilities of librarians that warrants constant competency upskilling would be in the development of library learning materials such as "research guides". This study intends to measure if the competencies of Letran Manila librarians are enough to effectively develop research guides.

To pursue the study, the researchers first interviewed the librarians assigned as "Research Guide Coordinators" during the trial and training phase of the project. The goal of the interview is to determine the skill sets needed to effectively produce research guides. Then using the identified skill sets, the researchers conducted a skills survey that determines the prior and present competencies of librarians in research guide development as represented in figure 2.

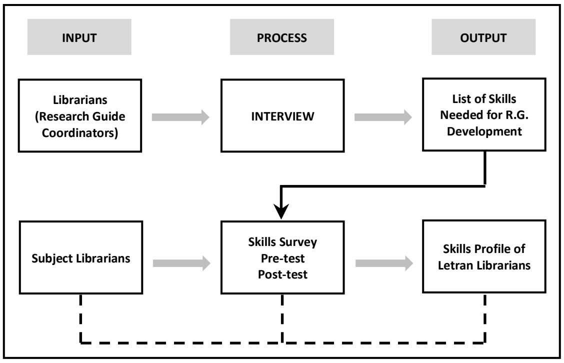

Figure 3. Conceptual Paradigm

Research Problems

The following are the research problems that the present study intends to address:

1. What are the required competencies needed by librarians in the development of Research Guides?
2. What is the present skills profile of librarians following the identified required competencies for research guide development?
3. What is the recommended training that librarians need to pursue to better improve the development of research guides?

METHODOLOGY

Design

A mixed-method Sequential Exploratory Design was used to determine and assess the lived experiences and skills profile of key respondents in connection with research guide development. The initial stage utilized Qualitative (exploratory) data gathered from the interview followed by the development of the skills survey instrument (Quantitative)in the succeeding stages. (Edmonds & Kennedy, 2017)

Participants

The respondents of the study include 2 former (both males) and 8 (1 male and 7 females) currently tenured librarians of Letran Manila Library.

Instruments

The study utilizes 2 research instruments:

Interview. This is a semi-structured interview that aims to identify the competencies needed by librarians in developing research guides. Librarians that were assigned as Research Guide Coordinators (4 librarians, 2 of which are no longer connected with Letran) during the "trial and training phase" of the project were subjected to this instrument. Research Guide Coordinators served as the trainers/ coaches of all Subject Librarians, furthermore, they also provided the 1st level of quality control on all guides before subjecting to layout development. The above-mentioned Research Guide Coordinators were also the ones who conceived and introduced the research guide project.

Pre and Post Skills Survey. This instrument was developed to identify the competency level of librarians in developing research guides before and after the implementation of the project. All tenured librarians that served as "Subject Librarian" roles were subjected to this survey.

Procedure

The researchers first sought the approval of the chief librarian and the informed consent of the 2 former librarians. Once the requests were approved, the researchers proceeded with data gathering using the instruments below:

Interview. A validated questionnaire was designed, and an interview was conducted via zoom web conference. Then the researchers utilized the data gathered from the interview to develop the skills survey instrument.

Skills survey. Using the competencies derived from the interview of Research Guide Coordinators, the skills survey was developed and validated. In the said survey, 7 key competencies were identified: (1) Information Literacy Skills, (2) Familiarity with Library subscription databases (EBSCOhost, ProQuest, etc.), (3) Awareness of Open Access Educational Resources, (4) Google suite familiarity, (5) Marketing Skills, (6) Familiarity with the curricular needs of Letran Programs, and (7) Collaboration skills.

2 batches of the survey were developed using google forms and were distributed via Facebook messenger to the target respondents. A pre-survey was first administered, the respondents were keenly instructed to rate their proficiency level on the skills based on their perceived level of competency before the research guide development. The Post-skills survey was immediately administered after the researchers received all the responses from the previous survey. In this survey, respondents were instructed to again rate their proficiency level but this time the sole basis would be their current skills in research guide development.

Measures

Gathered interview data were analyzed by grouping responses with similar themes. The pre- and post-skills survey utilizes the Likert scale for skill level below to rate the degree of proficiency on the 7 skills identified in this study:

Table 2. Likert scale interpretation

Scale	Intervals	Descriptive Rating
5	4.21-5.0	Highly Skilled
4	3.41-4.20	Skilled
3	2.61-3.40	Average or Moderately Skilled
2	1.81-2.60	Not very skilled
1	1.01-1.80	not at all skilled

Gathered data in the skills survey were tallied, then the weighted average mean was computed using the formula

$$WA = \frac{WP}{F} \qquad \textit{eqn 1}$$

where WP = Weighted Product

WA = Weighted Average

F = Frequency

The average days consumed by librarians in developing the first batch of research guides were computed using the Turnaround time (TAT) formula.

$$\text{Turnaround time} = \text{End time} - \text{Start time} + 1\ \text{day} \qquad \textit{eqn } 2$$

where

Start time = Range date of assigned, revised, the completed final layout

End time = Marketing Date

TAT = Turnaround time

RESULTS AND DISCUSSION

Required Competencies in Developing Research Guides

According to the interview data gathered from the Research Guide Coordinators, to produce effective research guides, librarians must possess the following competencies.

Information Literacy Skills. All four (4) Research Guide Coordinators unanimously agreed that sharpened information literacy skills are needed to produce effective research guides. This is supported by the following problems encountered by Research Guide Coordinators while evaluating the curated output of Subject Librarians:

- Inferior quality of research materials gathered.
- Unable to present resources that would support the target subject matter.
- Presence of unreliable sources.
- Links to resources are unresponsive.
- Bibliographic data are not enough to acknowledge the originator of gathered resources.

Information literacy is a set of abilities requiring individuals to "recognize when information is needed and can locate, evaluate, and effectively use the needed information (ACRL, 2000). These skills are badly needed by Subject Librarians to effectively locate appropriate groups of resources that could support the academic programs assigned to them for research guide development. Scouting resources from paid subscription databases and open access portals is a very daunting task, it is quite easy to be overwhelmed with the plethora of available information options. Mastering the following sub-skills of Information literacy will greatly help in curating relevant information resources:

- Determine the extent of information needed.

- Access the needed information effectively and efficiently.
- Evaluate the information and its sources critically.
- Use information effectively to accomplish a specific purpose.
- Understand the economic, legal, and social issues surrounding the use of information.

Familiarity with Library subscription databases. All the Research Guide Coordinators concluded that having the appropriate familiarity in accessing library subscription databases is very vital. The conclusion is warranted by the following observed difficulties because of not having initial tutorials: limited knowledge in terms of key features and functionality of the specific databases; filtering search results is not consistently performed; and copying of links not appropriate in retrieving the resources.

Awareness of Open Access Educational Resources. Research Guide Coordinators also observed that the majority of subject librarians, even themselves, had difficulties in locating and using the appropriate Open Access Educational Resources such as Limited knowledge about open access educational websites, where one may access the specific type of open educational resources (e-thesis, e-books- journals); Unfamiliar with the access restrictions for Full Text or Abstract; Some subjects have limited local open access resources and references.

Google suite familiarity. Research Guide Coordinators also observed that most Subject Librarians had difficulties in remotely accessing project files via google drive and manipulating encoded data on google worksheets and documents. This is an expected observation since, during the onset of the project, Letran librarians were not yet fully acquainted with the remote management of projects.

Marketing Skills. Though Research Guide Coordinators were not involved in layout development and promotion of research guides, they unanimously concluded that marketing skills are very vital competencies to hone, specifically the following marketing tools:

- Social media marketing
- Online and offline marketing apps/ software
- Public relation skills

Familiarity with the curricular needs of Letran Programs. The inability of subject librarians to fully grasp the scope and limitation of academic programs at the onset of the implementation of the project is the major difficulty observed by R.G. coordinators. Difficulties observed were as follows: At the onset of the project, specific subjects were given to Subject librarians while copies of CHED CMO/Course description/syllabus are still to be completed; concerns and issues on technical terminologies, and inconsistencies in subject/title codes.

Familiarity with the scope of the programs is very vital to efficiently locate pertinent information resources. To cope with the difficulty, Research Guide Coordinators required Subject Librarians to study the designated CHED CMO and syllabus of their assigned academic programs.

Collaboration skills. Due to the limitations set forth by the community lockdowns imposed by the covid19 pandemic, remote collaboration became a challenge. For this reason, Research Guide Coordinators concluded that heightened collaboration skills are very vital to produce effective research guides. The respondents also concluded that collaboration should not be limited within a department, it must extend to other departments and key institutions that may contribute to the success of the project.

Table 3. Competency Profile of Librarians in Research Guide Development

SKILLS	Former Skills (Pre-Test)	Mean	Current Skills (Post Test)	Mean	Mean Difference
1.Information Literacy Skills	**Average or Moderately Skilled**		**Skilled**		
- Determine the extent of information needed	3.13		4.25		
- Access the needed information effectively and efficiently	3.13		4.13		
- Evaluate information and its sources critically	3.00	**3.08**	4.00	**4.10**	**1.02**
- Use information effectively to accomplish a specific purpose	3.13		4.13		
- Understand the economic, legal, and social issues surrounding the use of information (proper citation)	3.00		4.00		
2. Familiarity with Library subscription databases (EBSCOhost, ProQuest, etc.)	**Average or Moderately Skilled**		**Highly Skilled**		
- Ability to perform simple and advance searches	3.25	**3.00**	4.63	**4.51**	**1.51**
- Awareness on different features and functions	2.75		4.38		
3. Awareness of Open Access Educational Resources	**Average or Moderately Skilled**		**4.25Skilled**		
- Ability to perform simple and advance searches	3.13	**2.88**	4.25	**4.19**	**1.31**
- Awareness on different features and functions	2.63		4.13		
4. Google suite familiarity	**Average or Moderately Skilled**		**Skilled**		
- Docs	2.63	**2.57**	3.63	**3.69**	**1.12**
- Sheets	2.50		3.75		
5. Marketing Skills	**Average or Moderately Skilled**		**Skilled**		
- Familiarity with social media marketing	2.88		4.00		
- Online and offline apps / software that can be utilized for marketing (ex. Canva, photoshop, etc.)	2.50	**2.71**	3.88	**3.92**	**1.21**
- Public relation skills	2.75		3.88		
6. Familiarity with the curricular needs of Letran Programs	**Average or Moderately Skilled**		**Skilled**		
- Familiarity with CHED CMOs	2.63	**2.69**	4.13	**4.19**	**1.50**
- Familiarity with the prescribed references for each program	2.75		4.25		
7. Collaboration Skills	**Average or Moderately Skilled**		**Highly Skilled**		
- Collaborates with colleagues to provide service to users	3.13		4.38		
- Develops collaborative relationships within the profession to enhance service to users	3.13		4.25		
- Develops and maintains partnerships beyond the library profession to strengthen services to users	3.00	**3.07**	4.13	**4.22**	**1.15**
- Collaborates and partners with the user in the information seeking process	3.00		4.13		
Overall Mean	**2.86 Average or Moderately Skilled**		**4.12 Skilled**		

Table 3 showcases the competency level of librarians in creating research guides before (former skills) and after (current skills) being subjected to the processes involved in the research guide project.

In the area of "information literacy skills, the mean score for former skills is 3.08 (average or moderately skilled). On the other hand, "current skill" garnered a total score of 4.10 (skilled). There is a noticeable 1.02 increase in competency level.

Meanwhile, the mean score for the area of "familiarity with subscription databases" bears the most increase among all the skill categories. From former skills (3.00 - average or moderately skilled) to current skill (4.51 - highly skilled) an increase of 1.15 was recorded. On the other hand, "Google suite familiarity" accumulated the least rise in the mean score (only 1.12 difference). The total scores for this category are as follows: former skills: 2.57 (not very skilled), current skills: 3.69 (skilled).

As seen in table 5, all the remaining skill categories distinctly experienced an increase in mean scores from former skills to current skill sets. In "awareness of open access educational resources", the increase in mean score is 1.31 (former: 2.71- average or moderately skilled, current skills: 3.92 – skilled), while "familiarity with the curricular needs of Letran programs" garnered an increase of 1.5 (former skills: 2.69 - average or moderately skilled, current skills: 4.19 - skilled), then lastly, "collaboration skills" earned a 1.15 increase (former skills: 3.07 - average or moderately skilled, current skills: 4.22 – highly skilled)

In a nutshell, the competency level of librarians in creating research guides has greatly increased after being subjected to the research guide development project. The average mean score of all the former skills combined is 2.86 which is interpreted as "average or moderately skilled", while the total score for all the current skill sets is 4.12 which is interpreted as "skilled."

Recommended Trainings for Librarians

Given the results of the skills profile of Letran Manila Librarians, the researchers would like to recommend the training plan below that covers all the competencies with "skilled" results in the post-test skill survey.

Table 4. Recommended Training Plan for Librarians

SKILLS	OBJECTIVES	ACTIVITIES	TIME FRAME
Information literacy	To equip Librarians with the following skills: – Determine the extent of information needed. – Access the needed information effectively and efficiently. – Evaluate the information and its sources critically. – Use information effectively to accomplish a specific purpose. – Understand the economic, legal, and social issues surrounding the use of information. (Proper citation)	Participate in the Letran RPD research convention or research conventions sponsored by library associations	Annually Regular invitation for a research proposal by the Research and Publication Department.
Awareness on Open Access Educational Resources	To equip librarians with the following competencies: – Ability to perform simple and advanced searches. – Aawareness of different features and functions	Enroll in Web Junction courses related to open access publishing and reference services. (or other free online course platforms) https://learn.webjunction.org/ Develop online tutorials in accessing and navigating specific OER platforms. (To be advertised in the Letran Manila website and Library Facebook page)	Summer Break Part of the annual staff development program. Annually Part of the Annual Library User Education Program.
Google suite Familiarity	To familiarize librarians with advanced features of the following G suite apps: – Docs – Sheet	Virtual Training Session about Google Suite (to be provided by the IT Department)	Monthly Part of the staff development program.
Marketing skills	To equip librarians with the necessary skills to master the following marketing tools: – Familiarity with social media Marketing – Online and offline apps/ software that can be utilized for marketing (ex. Canva, photoshop, etc.) – Public relations skills	Enroll in Web Junction courses related to social media marketing. (or other free online course platforms) https://learn.webjunction.org/ Virtual training on Photoshop and online apps for video and photo editing (to be provided by the IT Department)	Within semestral period -Part of the staff development program. Within semestral period Part of the staff development program.
Familiarity with the curricular needs of Letran programs	To provide librarians with an intermediate understanding of the scope and needs of Letran programs.	Participate in the curriculum subject mapping activities of Letran Manila programs Participate in the curriculum planning and development of Letran Manila programs	Annually Regular coordination of the library with the academic departments. Annually Regular coordination of the library with the academic departments.

CONCLUSION AND RECOMMENDATIONS

Based on the collected findings of the study, the following conclusions and recommendations were drawn.

Librarians are proven to be skillful in developing research guides. However, further training is still needed since the average total mean score for their current skills is only 4.12 which is interpreted as "skilled".

The Research Guide Project has significantly improved the competencies of librarians.

Librarians had a hard time achieving their current proficiency level in developing research guides. This is supported by the vast number of problems encountered by Research Guide Coordinators during the "trial and training phase" of the project. Another evidence that supports this conclusion is the computed average number of days consumed by individual librarians in producing the first Research Guide Layout, which states that it took 28 days to produce the first final output as described in table 5.

Table 5. Research Guide Development Process Turnaround Time

Curriculum Review Literature Survey / Information Packaging Evaluation	23.9 days
Final product	10.4 days
Promotion	50.2 days
Average	**28 days**

Current Research Guide coordinators must adhere to the original cycle of Research Guide Development (as specified in the Research Guide Development Manual) which highlights the participation of program coordinators in the quality control of produced Research Guides. The participation of program coordinators will not only improve the quality of Research Guides but will also allow Subject Librarians to improve their familiarity with the curricular needs of Letran Manila Programs.

Librarians should collaborate with faculty members in integrating research guides into the learning management system (LMS) of Letran. Such collaboration will not only increase the utilization of research guides but will also improve the collaboration and marketing skills of librarians.

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CORRELATION OF ORGANIZATIONAL TRUST, ORGANIZATIONAL COMMITMENT AND ORGANIZATIONAL INPUT FACTORS ON WORK PRODUCTIVITY IN THE CONTEXT OF HEI'S AMID COVID-19 CRISIS

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ABSTRACT

The global COVID-19 dilemma has created disruptions in organizational structures, systems, and processes. Most organizations including the academic sectors particularly HEI's – Higher Education Institutions are experiencing challenges and issues brought about by the pandemic situation. The study examined the relationships between and among Organizational trust (OT), Organizational commitment (OC), and Organizational input factors (OIF) on work productivity as perceived by the sampled n=190 faculty members across National Capital Region (NCR), the Philippines using an online survey questionnaire. The study also determined to what extent the HEI's implement the core dimensions of Organizational Trust such as Integrity, Dependence, and Competence as well as aspects of Organizational commitment in terms of Affective, Normative, and Continuance commitment as it relates with organizational input factors on work productivity amid COVID-19 crisis. Pearson's Correlation, mean rating, standard deviation, and regression analysis were used to test the hypotheses. Findings showed that Affective and Normative dimensions resulted in a high reason for organizational commitment. Results support the relationship between and among factors of OT, OC, and OIF and the study further revealed that Organizational trust and commitment are significant predictors of Integrity.

***Keywords**: Organizational trust, Organizational commitment, COVID-19 pandemic, Work productivity, Integrity, Reliability, Dependence, Affective commitment, Normative commitment, Continuance commitment*

INTRODUCTION

The Higher Education Institutions (HEIs) play an extremely important role in society since they are the key partners of the knowledge creation and knowledge exchange networks, catalysts of innovation, and makers of tangible outputs of research results and providing advisory and consultancy services. Schools and Universities are alleged to foster progress, build social capital, prepare students for outside realities, provide access to knowledge, extend the bounds of justice and, therefore, contribute to the creation of a democratic and sustainable society (Dziminska, Fijalkowska and Sulkowki, 2018).

However, the COVID-19 pandemic situation causes numerous disruptions, and the academic industry experiences issues and challenges. Education officials are forced to cancel face-to-face classes and shut the doors to campuses across the world in response to the growing coronavirus outbreak as this has become a worldwide health crisis according to Worldometer (2020) where countless people were infected and have died. Most governments have opted to use quarantine protocols and therefore firms and educational institutions restructure their organization systems and processes. Therefore, over a billion learners are affected worldwide (UNESCO, 2020), and there are over a million Filipino learners across all academic levels that need to comply with the Philippine government's quarantine measures.

Accordingly, HEI's has implemented proactive policies for the continuance of education despite the unforeseen situation. These policies and guidelines include flexible kinds of online education that aim to facilitate students' learning activities. Firms are evolving and innovating to adapt to the unprecedented global disruptions affecting work performance and productivity. Higher Educational Institutions are giving their best to deal with the ever-changing world. Organizational leaders are consistently noting that centralizing and accelerating decision-making processes, while gathering organizational inputs from key stakeholders, is a critical factor to the COVID-19 responses and this offers a way to find a solution to create sustainable development for the new set-up of online education. As most organizations undertake restructuring measures due to the unstable economic condition and lockdown situation, hence the educational institutions rely on the organizational trust and commitment of their faculty to deliver quality service. Academic Faculty on the other hand expect that educational institutions will act with integrity and reliability (Dziminski et al, 2018; Hansen 2011; Morgan 1994), and that trust can be an effective predictor of employees' positive attitudes and behaviors, such as cooperative attitudes, organizational commitment, and employee loyalty. Trust relations are an integral aspect of the quality of a school's social system (Goddard, Salloum, and Berebitsky, 2009).

Previous studies have found that when employees trust their organization, this will lead them to be more likely to share ideas and knowledge and be more creative in their job. Trust is an element of a relationship, but the mutually beneficial exchange is important to build trust, control mutuality, commitment, and satisfaction (Paine, 2003). The global pandemic crisis challenges most organizations specifically in the academic sector as most of the faculty were arranged to work from home. Trust in the workplace has a big impact on how employees communicate and collaborate. Employers started to realize how important it is to build trust where employees are still creative, passionate, and committed to their jobs amid the working atmosphere. Another concern on the critical challenge in the current environment according to Levenson and Mclauglin (June 2020) centers on how organizational leaders engage virtually in key decision-making processes with stakeholders and internal team members in ways that enhance trust, transparency, and teamwork. Employees in the workplace should have the right tools to communicate, collaborate, and feel supported to maintain productivity. The study examined the correlation among organizational trust, organizational commitment, and its organizational input factors on work productivity in the context of HEI's amid the COVID-19 pandemic situation since the data was collected during the lockdown.

Moreover, the study also determined to what extent the HEI's implement the core dimensions of Organizational Trust such as Integrity, Dependence, and Competence as well as aspects of Organizational commitment in terms of Affective, Normative, and Continuance factors as it influences organizational input factors on work productivity amid COVID-19 crisis. The results of the study will help organizations focus on the key drivers to workforce trust and commitment and ultimately on work productivity that is essential to organizational success. Limited research has been investigated as to the factors of organizational trust that have a significant relationship in the level of commitment and work productivity in the context of HEI's given the unprecedented condition due to COVID-19.

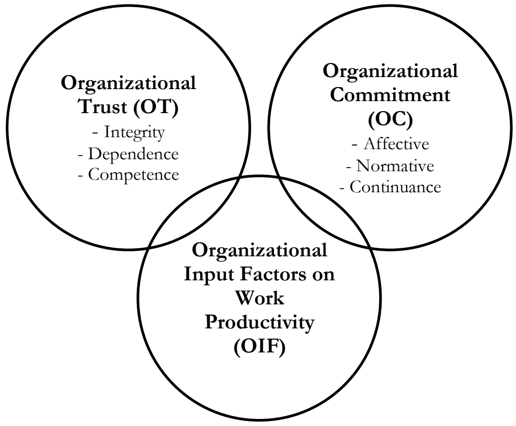

Figure 1. Research Framework

Statement of Hypothesis

H_{1o}: There is no significant relationship between and among Organizational Trust, Organizational Commitment, and Organizational input factors on work productivity in the context of HEI's amid the COVID 19 crisis.

Organizational trust and commitment in a pandemic situation

The global pandemic crisis brought about by COVID 19 has created disruptions in organizational structures, systems, and processes. Most firms specifically in the Higher Education Institutions (HEI's) are experiencing constant changes as they adapt to the challenging environment. Organizational trust and commitment during these tough times of the COVID 19 pandemic situation is relevant to organizational performance as both organizations and employees depend on each other to fulfill their goals, and objectives (Melton, 2020). Organizations are challenged on how to engage employees to stay motivated and committed.

Employees on the other hand are looking for areas in terms of trust, compassion, stability, and hope (Ratanji and Gandhi, 2020). An article from Mckinsey.com by Emme, Shrimper, Wood (2020) stated that with the pressing needs in terms of basic needs of employees, organizational leaders need to count on trusting relationships, social cohesion, an individual purpose that impacts employee well-being, and work effectiveness. Trust is essential to developing relationships with individuals (hbr.org, 2020), and organizational leaders who cannot inspire trust cannot lead, and there will be no followership. A study by Dzimiska, et. al (2018) shows that trust as a concept can be looked at a micro-level or as a psychological dimension. Canipe (2006), clearly stated that employee trust promotes a key factor for organizational success. Moreover, employees' trust towards their leaders and co-workers has been directly affecting organizational success. Upon reviewing the works of literature on organizational trust, the study focused on the dimensions that include integrity, dependability, and competence especially in this time of unprecedented crisis.

Trust – Integrity, Dependability, and Competence

Based on the study of Celep, and Yilmazturk (2012), organizational trust has a significant effect on organizational commitment. This result supports the fact that the trust of the role in teachers' putting more effort than expected without an expectation of reward in return has a significant effect. Effects of sub-dimensions of organizational trust have a distinct effect on organizational commitment. Similar to the study of Park, Henkin, and Egley (2005), suggest the importance of trust as a fundamental element in the effective school team's equation. Trust is essential for successful collaboration and interaction, foundations of productive group relationships. The study of Chaudhary, M.A., Chaudhary, N.I., and Ali (2020), also agrees that trust has a positive correlation that acts as a positive moderator in the relationship between student satisfaction and university performance. Integrity as a sub-dimension of organizational trust can simply be defined as the practice of being honest and showing a consistent and uncompromising adherence to strong moral and ethical principles and values. According to Paine (2003), integrity is the belief that an organization is fair and just. On the other hand, the result of the study of Shadid & Azhar (2013), shows that individuals who have integrity build trust in their relations with others and cause them to become more respected as friends, colleagues, mentors, and supervisors. Paine (2003), define dependability/reliability as the belief that an organization will do what it says it will do and that it acts consistently and dependably. This is supported by the study of Blaskova, Blasko, Kozubikova & Kozubik (2015), which confirms that the foundation of mutual trust and reliability is essential in achievement at a university and confirms the presumption that trust in terms of reliability relationship plays an important role for the students and the teachers in creating excellence in higher educational institutions. Competence on the other hand, according to Paine (2003), is defined as the belief that an organization can do what it says it will do. It includes the extent to which we see an organization as being effective; that it can compete and survive in the marketplace. The article of Hill and Lineback (2012), stated that competence is key in building trust in the organization. Similar to the study of Huang, Van den Brink, and Groot (2011), shows strong confidence of competence and willingness in protecting the interest of generalized people and ensuring fairness in enforcing procedure.

Focusing on building trusting relationships based on honesty, integrity, and genuine concern behooves an organization in the long run by having highly committed employees, retaining those employees, and having an advantageous reciprocal relationship when they support them. Building trust is not a one-time deal. Trust must be earned and developed over time (Fairholm, 1994) and it must be given its proper respect by organization leaders and their representatives to give it staying power so that a company, in this day and age, can pull ahead of the competition by maintaining highly committed, supportive, and loyal employee (Canipe, 2006).

Affective, Normative, and Continuance Commitment

According to Busch, Fallan, and Pettersen (1998), Organizational commitment has been an interesting research topic for organizational and behavioral researchers over the past three decades. This is because employee commitment has been recognized as one of the major determinants of organizational effectiveness, of higher levels of job performance, lower absenteeism, and lower turnover. The study of Yen, Campbell, Irianto, Zulyuri, and Fadilah (2014), divided commitment to an organization into three essential types: Affective commitment, normative commitment, and continuance commitment. Affective commitment is when an employee becomes involved and recognizes the value and relevance of his/her identity as an aspect of their association to the organization. Normative commitment is inculcated when the employee internalizes the organization's norms and values to his/her day-to-day socialization and engagement. Continuance commitment is based on the employees recognizing the cost of staying and leaving their organization. Universities and other team-based organizations that emphasize participative management systems and cooperative higher cognitive processes exemplify the necessity for multidimensional conceptualizations and suggest the importance of distinguishing commitment to an employee's work with a team from a commitment to the employing organization.

According to the study of Allen and Meyer (1990), Affective Commitment is an unwritten agreement between the employee and the employer. The development of such affective commitments lies at the nexus between the identities of staff and the way these identities are reinforced and realized through social interactions, social recognition, and day-to-day social capital. Based on the study of Ahuja & Gupta (2019), an employees' value proposition of care and worry fuels affective commitment which has a strong positive relationship with work engagement. It is established that faculty members who are highly committed to their organizations are likely to be more work engaged than their less committed counterparts. On the other hand, the study of Lovakov (2016), resulted in a mixed result, faculty who combine teaching and administrative positions at the same university is more effectively committed and shows this relationship is refereed by the role of conflict. Therefore, the perceived role conflict challenges the affective commitment of the faculty. However, the positive effect of combining positions on affective commitment is stronger than the negative effect. On Continuance Commitment as originally defined by Meyer & Allen (1984), continuance commitment relates to the costs of staying or leaving, and normative commitment is the "feelings of obligation towards the organization." The study of Tutei, Geoffrey, and Jared (2017) shows a weak negative relationship between continuance commitment and employee performance in an HEI.

In addition to this the study of Campbell and Hwa (2014), also agrees that continuance commitment indicates a negative relationship between a sense of productivity and contribution to the community. On contrary, the study of Dixit and Bhati (2012), indicates that the "employees are enthusiastic in reflecting their continuance commitment in their work environment to render maximum productivity. According to the study of Coetzee and Rothman (2005), Normative Commitment shows a feeling of obligation to continue his/her employment. Further highlighted, that the feeling of obligation to stay with an organization may result from the accepting of normative pressures exerted in an individual before entry into the organization or following entry. In addition, Yao & Wang (2006), examines that as cross-cultural research becomes more evident, and the role of normative commitment is gaining more consideration.

In contrast, the study of Abdo Saeed, Gelaidan, and Ahmad (2013) shows that all organizational commitment dimensions except the normative commitment found not significant to transformational leadership. The result implies that the leadership style which leads to positive changes in those who follow is not a good predictor of normative commitment same as transformational leadership. An examination of the relationship of organizational trust and commitment in the workforce (Darraugh, 2006) shows that trust enhances productivity and is consistently associated with positive affective responses that are related to desirable outcomes such as an intention to stay and organizational commitment.

Organizational Input factors on Work Productivity

The economic definition of work productivity is the relation between all the physical quantities of outputs and the physical quantities of all inputs. Massy, Sullivan, and Mackie (2012), state that both input and output quantities should be adjusted for variations in quality, because of changes in technology, facilities, and computers that are not directly comparable to those produced a decade ago therefore, techniques and processes should be comparative adaptive in this changing society. On the other hand, Meyer, K. (2012), explains motivation has a connection to work productivity in terms of teaching online. Both personal and professional are often intertwined. Some "love" being online although they are also aware that there are costs, in terms of their time, to do it and do it well. The study also shows that the work productivity of the teachers increased although so has their workload in some instances.

The study of Lozano, Ceulemans, Almieda et. al. (2015), states that organizational practices and standards have a strong correlation with the work productivity of the organization. Higher educational institution practices in terms of culture and policy standards aim to have a greater role in increasing improvement productivity to optimize quality and improve efficiency. Similarly, the study of Huang, Ahlstrom, Lee, Chen, and Hsieh (2016), states that key practices influence the high-performance system of the employee. In contrast, the study of Ab Hamid (2015), suggests that organizational practices are indirectly affecting the work productivity of the faculty and including the staff but instead it is affected by the cultural values of the employees. Meanwhile, the Quality Information system as various authors shared has different aspects, specifically for higher education institutions such as design and development experience, data quality and management, the impact of different information in decision-making, web portals with academic information, and more.

According to Hasan Al-Mamary, and Shamsuddin (2014), the quality of information systems has a significant impact on work productivity. The quality of the information system used in an organization dictates the increase or decrease of work productivity, with a better cause for improvement in organization performance. In addition to this, the study of Mukred and Yusof (2018), shows that a quality information system is significantly related to the intention to adapt the e-records management system to increase the work productivity of professional education. Working Environment as another organizational input factor refers to the surroundings and anything that can affect human beings. In the business context, a working environment refers to the environment that employees working-in which collectively achieves an organizational goal.

According to Nakpodia (2011), states that a good working environment only exists when the essential need and the facilities that can help the employees to do their work are provided. Facilities and essential needs such as air-conditioned offices, functional furniture, good working space, good communication, and network information technology, a pleasant atmosphere, and an organizational climate. The study of Ajala (2012), shows that having a good working environment and good communication places a significant effect on improving the productivity of an employee. Jaar, 2017 in his study states that organizations should create an enabling environment that will make the employee feel within the organization to aid their commitment level. Organizational leaders should lead with integrity, openness, reliability that would inspire subordinates to increase the support needed for organizational success. Similar to this, the study of Hanaysha (2016), found that the work environment has a positive effect on organizational commitment. This implies that the work environment plays a key factor in the productivity of the employee in HEIs.

Lewicka and Krott (2015) successfully verify the model of the relationship between the HRM system (practices, process), organizational trust, and commitment wherein the impact of the HRM process on creating organizational trust is higher.

An article about enterprise sustainability during the covid pandemic states that (Obrenovic et.al. March 2020) companies with distributed leadership to the workforce are more likely to sustain business operations where organizational leverage on ICT, intranet, social media, and online communication platforms into their daily routines helps to establish trust. Key to the success of business recovery is the renewal of trust between employers and employees - therefore, transparency in communication, role clarity, and individualized work allocation are aspects that business leaders need to focus on (Chanda, A., 2020).

Relatively, several theories and research have proven the relationship between organizational trust and commitment as mentioned in the related literature. But with the current pandemic situation, given the lockdown and work from home education, the study aims to determine the applicability of the theories and determine the co-relation of organizational trust and commitment among faculty as well as its organizational input factors on work productivity in the context of HEI's amidst the COVID-19 condition.

METHODOLOGY

The quantitative research design was used to examine the correlation of organizational trust and commitment and organizational input factors on work productivity amid the COVID 19 pandemic situation. The study consists of male and female faculty members in the academic sector specifically at HEI' s - higher education institutions in the National Capital Region (NCR), Philippines, and data were collected from January 2021- mid-February 2021.

The target size of the population was 1000 (N=1000). Using the Cochran formula to compute the sample size, the recommended sample size of 243 respondents was obtained. The respondents were selected using a simple random sampling method. A self-administered questionnaire was used to solicit data from all the sampled faculty members with employment tenure of 6 months onwards to ensure familiarity of the organizational processes especially during quarantine and remote working situations and almost n=190 respondents with valid responses were retrieved with an acceptable retrieval rate of 78 percent. Trust was measured using a typical Trust Measurement Questionnaire by Paine (2003), while the Organizational Commitment Questionnaire (OCQ) by Meyer and Allen (1997) is used to measure employee organizational commitment. Knowledge Worker Productivity Assessment (KWPA) by Antikainen & Lonnqvist (2006) is used to measure organizational input factors on productivity of work. Consent was also requested from the respondents before the distribution of the questionnaires.

The respondents were made aware of the research objectives, ethical considerations, and confidentiality of the respondents were emphasized. The Cronbach alpha has a value of 0.970. Descriptive correlation statistics was used such as Pearson's Correlation, Mean, Standard Deviation, and Regression analysis to process the data gathered.

RESULTS AND DISCUSSION

Problem 1 - As to what extent does the selected HEIs implement the dimensions of Trust in terms of Integrity, Dependability, Competence?

On Integrity

The attribute of being honest, upright, and impartial defines the attributes of Integrity. The overall area mean rating of Integrity was 4.09 or mostly agree with the Sd = .999. Consistent results were observed and of the five-item components on integrity, the highest rating (4.13) was observed in the fair and just treatment of the HEIs to its people. The absence of practices misleading people received the second-highest score of 4.10, complementing the highest rated item. All computed standard deviation registered minimal values, indicating the ratings made by the respondents are relatively similar or close with each other.

On Dependability

The second facet of Organizational Trust is Dependability where the overall area mean rating was 3.929 or mostly agree with the Sd = .9927. In like manner, all item components received a rating equivalent to mostly agree. This in effect suggests that in general, the respondents feel that their respective organizations can be trusted and demonstrate practices leading to trustworthiness. Among the four-item components of Dependability, the highest rating (4.03) focused on the reliability of the organization to keep its promises. As it manifests, the respondents felt that their respective HEIs fulfil their plans and programs to the faculty members. Implementing fair treatment or not taking advantage of its people received the second-highest rating of 3.95. Willingness to make decisions for every individual faculty member and considering opinions of the faculty members both obtained ratings of mostly agree. The ratings establish the finding that indeed, Dependability is observed by the respondents.

On Competence

Competency received an overall rating of 4.05 or mostly agree with an Sd =.9927. This in effect suggests that in general, the respondents observe Competency in the organization. In like manner, the three-item components of Competency all received ratings translating to mostly agree.

Among the core dimensions of Organizational trust, factors on Integrity have the highest mean with an overall rating of 4.09. Amid a pandemic crisis, the study revealed that the organization treats faculty members fairly and justly guided with sound ethical principles which are expected in any academic setting. Deduced from the overall findings on Organizational Trust, the organizational practice of the Trust dimensions such as integrity, dependability, and competence are evident among the HEIs. This is a clear indication the organizations have developed trust among employees they are a strong asset of high functioning organizations. This is inconsonant with the study of Fard & Karimi (2015), that organization with trust among employees is successful in realizing its vision, mission, goals, and objectives.

Problem 2 - As to what extent does the selected HEIs implement the dimensions of Organizational Commitment in terms of Affective, Normative, Continuance?

On Affective Commitment

Affective Commitment received an overall mean rating of 4.15 or mostly agree with Sd = 1.01 This signifies that such kind of Commitment is persistent among the employees. As defined, Affective Commitment exhibits the emotional attachment of an employee to the organization. Of all the different forms of Commitment, three-item components received the highest qualitative equivalent of greatly agree. These include the feeling of being proud to be associated with the organization, feeling a sense of loyalty, and valuing the relationship with the organization. All these components' registered ratings greatly agree. This in the end manifests that emotional attachment is indeed persistent to the respondents. All other components received ratings equivalent to mostly agree, signifying the presence of affective commitment.

On Normative Commitment

Normative Commitment received an overall mean rating of 4.15 or mostly agree with Sd 1.01. As defined, this Commitment is reflective of the Filipino Culture of having to stay in the organization because of gratitude and a sense of obligation. All components of Normative Commitment likewise received ratings confirming its presence. The item with the highest rating dealt with the employees' loyalty to the organization. It is a rating of greatly agree emphasizes that indeed, loyalty is highly evident among the respondents. Seeing themselves working in their current company than another and believing that their current company deserves their loyalty all registered the highest ratings. Meanwhile, the lone item that received a rating of somewhat agrees focused on the negative statement of feeling regrets on their chosen profession. The rating of somewhat agree signifies a degree of regret, though at a very minimal rate.

On Continuance Commitment

The overall mean rating for Continuance Commitment was 3.68 or mostly agree with the Sd = .928, signifying that in one way or another, the respondents feel the convenience of remaining committed to their respective HEIs on the account of benefits and convenience. Except for one item, all components of Continuance Commitment revealed ratings equivalent to mostly agree.

Among the eight components of Continuance Commitment, the highest mean rating (4.12) focused on the organization's willingness to maintain a relationship with every employee. Developing a strong bond with the employees received the second-highest rating. Results manifest that the employees see their respective organizations implement activities or demonstrate practices leading to building bonds or relationships.

The direct link to Continuance Commitment is exhibited on the third to the seventh items in the ranking of item mean ratings and demonstrated the difficulty of leaving their work, lesser options at the job market, and staying at the university as a matter of convenience. There is more to lose if the respondents would leave their respective organizations. This in effect drives their Organizational Commitment. As ratings suggest, this kind of commitment is persistent among the respondents.

The overall results showed Affective and Normative commitment with an equal overall mean rating of 4.15 and the study reveals that the faculty members are emotionally attached to the organization with a deep sense of loyalty despite the current COVID-19 situation where challenges and issues are present. The results are aligned with previous studies (Rafiei, et al., 2012; Yilmaz., 2008; Qaisar, et al., 2012) that discovered the positive impact of three dimensions on the performance of personnel in different work situations. Deduced from the findings, high organizational commitment manifest in their willingness to achieve their duties and aspirations to perform better. In this respect, employees with an evident high level of organizational commitment are vital in realizing their organizational goals and objectives.

Problem 3 - What is the perceived level of assessment on the work productivity concerning organizational input factors concerning Organizational Practices, Quality Information system, Working Environment?

On Organizational Practices and Standards

Organizational Practices and Standards as perceived by the respondents revealed an overall area mean rating of 2.65 or agree or Sd = .989. This manifests that in general, the identified attributes are persistent and observed by the respondents. Among the six components, having work that entails training received the highest mean rating of 3.36. This finding implies further situations such as the respondents are regularly exposed to new tasks and responsibilities. The nature of work is not monotonous and seeks the challenge to improve. This is likewise complemented by the item with the second highest mean rating, which states employees are exposed to work that cannot be accomplished from their colleagues' work experiences. The items that received the lowest ratings include difficulty in exploiting organizational standards, organizational practices hindering the effectiveness of work, and personal characteristics preventing them to accomplish their work.

On Quality Information System

Quality Information System received an overall mean rating of 2.54 or somewhat agree. This relates that in general, the respondents only partially observe the conditions described in the Quality Information System. The item with the highest mean rating (2.82) focused on the failures of scheduling. This signifies that in one way or another, such kind of problem persists among the different schools. Regularly looking for documents needed, demanding more time to cope with tasks. and waiting for needed documents all received ratings of agree. This suggests that in general, all these challenges are experienced by the respondents.

Meanwhile, items that received the lowest ratings of somewhat agree focused on the inability to perform well because of certain issues, presence of errors in the information, and difficulty of finding information. These items received the lowest ratings validating their presence, albeit to a limited extent.

On Work Environment

Work environment revealed an overall mean rating of 2.34 on the negative scale, which is interpreted to somewhat agree however, a mean score of 3.67 using the reversed or positive scale would show as mostly agree with an Sd = 1.154. This indicates that in general, the positive versions of the statements of the Working Environment are experienced by the respondents. Consistent with the overall findings, all item components received the same qualitative equivalent.

Among the different facets of the Working Environment, the highest was observed on expressing critical ideas that are not ignored or dismissed. This signifies that in general, the respondents felt that there are platforms where the respondents' sentiments are recognized. Despite the current working environment using an online platform, the study still revealed a positive perception in terms of organizational input factors on work productivity.

Problem 4 - Is there a significant relationship between and among organizational trust, commitment, and perceived work productivity?

Table 1. Summary of the Correlation coefficient

		Organizational Commitment	Organizational Trust	Working Environment	Quality Information System	Organizational Practices and Standards	Competency	Dependability	Integrity
Organizational Commitment	Pearson Correlation	1	.797(**)	-0.107	0.021	.189(**)	.772(**)	.786(**)	.747(**)
	p-value	.	0.00	0.14	0.775	0.009	0.00	0.00	0.00
Organizational Trust	Pearson Correlation	.797(**)	1	-.281(**)	-.159(*)	-0.001	.961(**)	.962(**)	.971(**)
	p-value	0.00	.	0.00	0.028	0.989	0.00	0.00	0.00
Working Environment	Pearson Correlation	-0.107	-.281(**)	1	.818(**)	.631(**)	-.265(**)	-.257(**)	-.292(**)
	p-value	0.14	0.00	.	0.00	0.00	0.00	0.00	0.00
Quality Information System	Pearson Correlation	0.21	-.159(*)	.818(**)	1	.736(**)	-0.138	-.159(*)	-.164(*)
	p-value	0.775	0.028	0.00	.	0.00	0.057	0.029	0.024
Organizational Practices and Standards	Pearson Correlation	.189(**)	-0.001	.631(**)	.736(**)	1	0.017	0.023	-0.043
	p-value	0.009	0.989	0.00	0.00	.	0.818	0.757	0.558
Competency	Pearson Correlation	.722(**)	.961(**)	-.265(**)	-0.138	0.017	1	.878(**)	.907(**)
	p-value	0.00	0.00	0.00	0.057	0.818	.	0.00	0.00
Dependability	Pearson Correlation	.786(**)	.962(**)	-.257(**)	-.159(*)	0.023	.878(**)	1	.905(**)
	p-value	0.00	0.00	0.00	0.029	0.757	0.00	.	0.00
Integrity	Pearson Correlation	.747(**)	.971(**)	-.292(**)	-.164(*)	-0.043	.907(**)	.905(**)	1
	p-value	0.00	0.00	0.00	0.024	0.558	0.00	0.00	.

Table 1 shows the summary of the correlation coefficient. When the variables were subjected to a test of correlation, results showed significant findings on a few and selected variables.

Organizational Commitment was significantly correlated with Organizational Trust, Competency, Dependability, and Integrity. As observed, all correlation coefficients generated p-values less than the level of significance of 0.05. This indicates the presence of a significant correlation. Moreover, the magnitude of the correlation coefficients was nearing to positive one, signifying a strong and positive correlation.

Organizational Trust was significantly correlated with Organizational Commitment, Competency, Dependability, and Integrity. All correlation coefficients registered p-values less than the level of significance of 0.05, manifesting significant correlation. In addition, the correlation coefficient generated was nearing a positive one, relating strong and direct correlation.

Another variable with significant and positive correlation includes Working Environment to Quality Information System and Organizational Practices and Standards. Pearson Correlation coefficients were near to 1, manifesting strong correlations.

Quality Information Systems was significantly and positively correlated with Organizational Practices and Standards. The coefficient computed was near to one, relating strong correlation.

Competency is significantly correlated with Dependability and Integrity, both to a positive and strong extent.

Dependability is significantly correlated with Organizational Commitment, Organizational Trust, Competency, and Integrity. All registered positive and strong correlations.

Integrity was significantly correlated with Organizational Commitment, Organizational Trust, Competency, and Dependability. All on a degree of strong and positive correlation.

In summary, Organizational trust (OT) and organizational commitment (OC) signified a strong and positive correlation. However, OT and OC indicated a negative correlation value with the Organizational Input factor (OIF) despite the result that variables among Organizational Practices, Quality information system, and Working environment strongly relate significantly. As factors on integrity, dependability, and competence manifested to be strongly related, integrity proves to be significantly correlated to OC and OT.

Table 2. Relationship between and among the different variables

Predictors	Unstandardized Beta Coefficients	t-statistics (p-value)	F-ratio (p-value)	R-squared
Constant	.173	2.086 (0.038)		
Organizational Trust	1.063	36.449 (0.000)	3139.085 (0.000)	0.945
Organizational Commitment	0.90	-2.599 (0.010)		

Table 2 depicts the regression model that Organizational Trust (OT) and Organizational Commitment (OC) can significantly predict the respondents' perceptions of Integrity. The specific extent of influence of Organizational Trust to Integrity is summarized in the equation below.

$$Integrity = 0.173 + 1.063OT - 0.90OC$$

This supports the study on Integrity as the foundation of trust and confidence. People with integrity are considered trustworthy. All successful businesses are built on relationships. In the absence of integrity and honesty, the relationship between co-workers may be damaged which may lead to a decline in productivity. (Flanagan, E., Christ D., 2018). Similarly, Organizational trust supports the theory that the more that followers perceived their leaders exercising behavioral Integrity, the more they would trust that leader and be vulnerable to him or her with that trust leading to more positive attitudes toward the leader and better job performance. (Prottas, 2018; Simon, 1999, 2002, 2015). The research study also supports Tan and Tan (May 2000) that employees who trust the organization will likely enjoy working in the organization and will likely be interested in pursuing a long-term career in the organization. Therefore, such employees are less inclined to leave the organization.

CONCLUSION

Trust is one of the most important conditions that must exist within changing organizations to promote commitment through change initiatives, consistency in productivity, and overall organizational health, all of which are necessary for success in a globally competitive business market (Canipe, 2006; Fairholm, 1994; Harvey,1989; Britton and Stallings, 1986).

Organizational leaders should carefully concentrate on their responsive and supportive behavior, which through improved procedural justice will influence mostly organizational trust integrity and dependability, that in turn by influencing mostly organizational commitment, will ultimately have a significant impact on organizational growth (Katou, A., 2011). Thus, the results of the study contribute to the existing literature by highlighting the importance of integrity and organizational trust as it relates to the reason why faculty members tend to exhibit organizational commitment, which could in turn positively influences organizational growth.

Previous studies showed that Organizational Trust was found to be positively correlated with organizational commitment while findings on this study revealed that despite the COVID-19 crisis, it depicts that Integrity significantly relates with Organizational trust and commitment as a strong determinant in an academic HEI setting. Moreover, affective and normative commitment were found to have high indicators in the level of organizational commitment during these tough times of pandemic situations. Organizational trust is relevant to organizational performance as both organizations and employees depend on each other to fulfil their goals and objectives (Melton, 2020) which leads to organizational commitment and positive work productivity.

The authors conclude that given a disruptive environment amid COVID – 19 situation, online education remains to be relevant and faculty members are effectively committed to rendering service as manifested in the study. Finally, the Regression results showed that Organizational Trust and Organizational Commitment can significantly predict the respondents' perceptions on Integrity

Research Implications and Future Research Directions

In an academic setting where business processes and systems in higher education institutions were disrupted due to Covid -19 crisis, findings in the study revealed the relevance of organizational trust and commitment specifically giving an important focus on academic integrity as it strongly relates with each other. Organizational leaders should build a strong mutual relationship with employees despite the remote work from a home arrangement by fostering organizational trust. The organization must maintain the value of Integrity as it depicts fairness and trustworthiness in a workplace despite distant working relationships.

COVID-19 pandemic brought changes in the HEIs workplaces that require alternative new work strategies to be responsive to this current situation. Although very limited research about HEIs under this situation, here are some ways that can be applied as well as create meaningful organizational health and viability, action must be taken at all levels.

1. Invite the attention of the top management and policymakers to take measures to improve the level of organizational trust and commitment to increasing the faculty members' perception of integrity that may lead to improved productivity that is relevant to online education.
2. Create transparency and encourage open communication that will allow faculty members to share their ideas and suggestions are being considered. This would foster a sense of trust and confidence that will allow them to improve their work productivity. Likewise, emphasize trust within the organization by cascading clear communications with information and decisions.
3. Demonstrate care and concern for the employees and the organization. Foster positive relationships to gain faith with their superiors and other members of the organization.
4. Maintain good work ethics that assures employees of equal opportunities for their career advancement.
5. Trust on how the faculty members take care of their work, and provide constructive feedback regularly, this helps build certainty and confidence at work. Give chances to build cooperation and confidence in their organization.
6. Provide the faculty members with the support and resources they need so that they will be empowered to discover new ways to apply technology and other tools to achieve their work more productively.

Furthermore, the limitations of the study in which the sampled respondents were concentrated on the HEI's only covers faculty members at the collegiate level. Other academic sectors including basic and senior high school education levels as well as non-teaching personnel could be considered as respondents for future research endeavors to measure a wider scope of the study.

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OPTIMIZED AND AUTOMATED SOLAR POWER CONVERSION AS SECURITY(AC) LIGHTING SYSTEM

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ABSTRACT

As a response to Colegio's advocacy regarding care for creation, this research project is focused on the design of a prototype of an Optimized and Automated Solar Power Conversion of Security (AC) Lighting the System. This study is conducted to help decrease the energy consumption in the school wherein its power is off the grid and enhance better security at the gate entrance at night where it is located. It is installed on the top of the guardhouse roof to maximize the light absorption of the solar power even during the rainy season utilizing the Monocrystalline material as the panel itself. This project is mainly allocated with the construction of the electronic hardware design using a battery and a Maximum Power Point Tracking (MPPT) charge controller to support the storage unit of electricity and a solar panel to harness solar energy. Its functionality was assessed by the accuracy of the cyclical charge and discharge time operations day and night. Power management aims to operate as a counter-measure to the effect of shortage in the storage of electricity during rainy days and cloudy days. It also uses an automation system for charging control and for the utilization of enough power in spotlights. The hardware design was embedded and specialized using the maximum power point tracking system to control the operation of the device which will act to assist in storing energy in the primary container. The study has concluded that charging full-time voltage during the rainy season accumulated to an average of 6.95 hours while in sunny weather conditions, accumulated only an average of 5.38 hours, and by this, the system was able to sustain enough amount of power storage at varying weather conditions. The discharging operations of the light that continuously illuminates at night accumulated into an average of 12 hours and 10 minutes. The researchers subsequently implemented the installation of this project study that will be used and utilized at the main entrance of the Colegio. The study is recommended for further improvement of the hardware feature employing a PIR automatic sensing technology to improve power optimization from time to time.

***Keywords**: Photovoltaic Cell, MPPT, Circuit Breaker Module, Inverter*

INTRODUCTION

The energy demand across the globe has increased due to rapid advancement in the industry and even in household which led engineers to create more renewable or alternative source of energy like solar power as one of the abundant sources available within our environment's natural resources (Sharma and Goel, 2017). Solar photovoltaic cells can be an appropriate technology for a source of renewable electricity in developing nations, especially in remote rural areas (Shahsavari, A.,2018). Photovoltaic systems have been made essential and served as the best alternatives in renewable energy sources (Kumar and Sudhakar, 2015). According to the U.S. Department of Energy, the amount of sunlight that strikes the earth's surface in an hour and a half is enough to handle the entire world's energy consumption for a full year. Solar technologies convert sunlight into electrical energy either through photovoltaic (PV) panels or through mirrors that concentrate solar radiation. This energy can be used to generate electricity or be stored in batteries or thermal storage.

The place where the project was built, can manage hundreds of wattages from solar energy where it is exposed to sunlight due to the high land area within the vicinity. In this exposure, solar energy is unparallel, unsoiled and prospective energy source among all other nonconventional energy options (Ahsan, et.al., 2016). The research project worked on the electrical design unit as well as the safety features of the prototype and most importantly, the illumination at night using the alternating current power generated from the sun. The function of a supercapacitor will suffice the primary storage unit into the extent of a stand-alone system (Kouchachvili, L., 2018). In addition, a lead-acid gel battery combined with the sulfuric acid is mixed with finely divided silica, which forms a thick paste or gel. The freshly mixed gel is poured into the cell container before it sets. As the gel dries microscopic cracks form that allows the passage of gas between the positive and negative plates required for the recombination process (Spiers, 2018).

Capacitance builds up electricity, in common with a battery. The only difference is that an insulator device like a capacitor manages to rapidly switch the charging and discharging cycle at a fast rate, unlike batteries. The supercapacitor is an electronic component that has a high capacitance value of up to 500F or more which functions to collect a huge amount of electricity in a short period. The environmental aspect related within power generation with the harnessed solar energies from the solar panels which reduces carbon emission and carbon credits were considered also for the implementation and operation of the solar plant system in the location of its installation unit (Khatri, R., 2016).

Capacitors were commonly constructed in use of storing electrical charges between central layers of non-conductive materials. The activated carbon which is the unique material used to cover the storing capability of this device acts as the physical super barrier to making charging quick and huge. That is why the fast-charging capability supports the storage unit which is enhanced the network of supercapacitors of 500F each that produces a maximum output of up to 18VDC in its full charged condition during the daytime. This might extend the battery life because its usage is not stressed due to this component that gives the aid or support

Table 1. Power Consumption Efficiency Comparison for Lighting Systems

Features	LED	Fluorescent	Incandescent
Light bulb projected lifespan (hours)	25,000	10,000	1,200
Watts per bulb (equivalent 60 watts)	8.5	14	60
Cost per bulb	₱5	₱2	₱1
KWh of electricity used over 25,000 hours	212.5	350	1500
Cost of electricity (@ 0.10 per KWh)	₱21.25	₱35	₱150
Bulbs needed for 25,000 hours of use	1	2.5	21
Equivalent 25,000 hours bulb expense	₱5	₱5	₱21
Total cost for 25,000 hours	₱26.25	₱40	₱171

Source: (US Department of Energy, 2018)

The loading system deployed uses an AC lighting or the alternating current (AC) source employed to drive the LED lighting system. An alternating current of a light-emitting diode that operates directly out of the alternating current line voltage instead of utilizing a driver to transform the line voltage to direct current power. An alternating current LED chip has a plurality of LED units formed on one chip and is assembled into a circuit loop to be directly used in an alternating current field. An AC LED is also referred to as a high voltage light-emitting diode since it is clear of a current conversion driving component and can be directly employed in mains electricity which is a high voltage (https://www.manufacturer.lighting).

The study determined the construction process of the electrical design of an Optimized and Automated Solar Power Conversion as Security (AC) Lighting System that fabricated a prototype with the safety features embedded in a control room for monitoring and control purposes of the lightings and the light sensor device. MPPT was also used to take advantage of its fast-charging properties. It is because it will serve as an intermediate system that mainly uses a PowerPoint tracking system to save more energy in the peak hours in the battery while it can also accumulate energy directly from the solar panels. This increases a more current flow that will make the system charge more rapidly. In the absence of sunlight due to rainy seasons, the charging process might resume charging the energy in aid of these supporting devices.

The construction built of the hardware features a maximum power-point tracking solution, a light-emitting diode lamp, a Gel type 12VDC battery, and two monocrystalline solar panels that correspond to the operation from charging up to its lighting functionality. The assessment of the performance was evaluated in terms of the charge and discharge rate records within the vicinity of the installation. The lighting system is currently utilized at the gate entrance, which acts as the only illuminating unit in front of the school vicinity can spontaneously enhance security and will continue to support security personnel duties at night that somehow sustains its power which is generated by its own and acts as an OFF grid within the system operations cycle. By these, it can lessen power consumption as a means of illumination during nighttime. The hardware design was continuously developed and inspired by the previous projects which were the charging station unit and the streetlights. Operating with the aid of solar powers in generations of renewable and alternative sources of energy that will support, maximize, and conserve natural resources.

This case study will be an essential reference, guide, and related literature for providing consistent information regarding the Optimized and Automated Solar Power Conversion as Security (AC) Lighting the System and about renewable alternative energy sources or another related environmental energy project. As in the field of electrical engineering, the innovation of technology for power generation will be installed at the school to provide an alternative source of energy to utilize the spotlight energy at night. In the field of electronic devices, the researcher wants to emphasize one of the unique features of this project which is the function of a control system through combining the property of a supercapacitor as an automated fast charging device to aid the battery in its function as a primary storage unit. By the future implementation of this study, an alternative source of renewable energy will be developed to generate electricity without degrading the environment and natural resources in its process.

METHODOLOGY

This study used a descriptive research design that supports necessary information from the device's performance and operations efficiency, accuracy, and effectivity of the variables involved within the study (McNeill, 2018). Data was collected and compared with the existing studies and platforms to exemplify the performance evaluations of the system unit developed initially. In this method, the collected parameters of measurements were carefully analyzed from the digital readings of the lighting system to specify the actual rate versus an ideal rate of performance. Charging time at rainy and sunny weather conditions were the gathered data as well as the discharge rate at night of the battery. The electrical characteristics limitations, capabilities of components' hardware, literature, and facts were found through minor sources such as books, published and unpublished journals, and mostly on websites.

General Method Used

The researcher conceptualized the project by having the Rapid Android Application Development RAAD model as a guide in the development of the proposed system. The following are the processes that were followed.

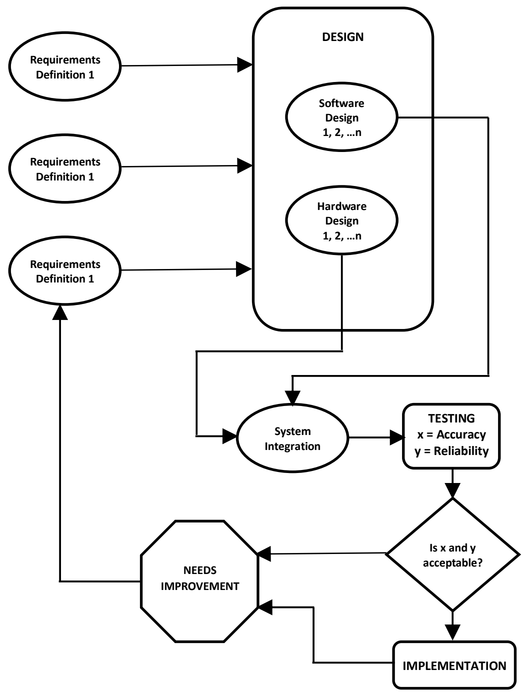

Figure 1. Rapid Android Application Development

Requirement Definition

With the initial development of the study, a simplification of the overall process from the existing spotlight of the school was considered. To get the relevant information, the researcher will obtain the following information such as the power consumption and the illumination system span coverage of the lighting unit in the vicinity of the area. The gathered data for the proposed system will be recorded to expand the process flow of the system.

System Design

This part comprises the composition of the structures to build the hardware and software. It will serve as a complete guide for visual analysis and interaction of the system electrical unit built integrating within the platform and software's Maximum Power Point Tracing System. The user interface that will be provided will have a current list of all security personnel that can be customized by the system user itself.

In the early development of this project, the Rapid Android Application development was used. This technique allows determining the requirements to be included in the design so that the desired characteristics of the system can be tested. It will also provide an opportunity to identify the necessary improvements in the design and functionality of the system as recommended by the end-user.

Hardware Design

The representation of a pictorial block for each module to the entire hardware is linked to exemplify the interactions between all the components used. The schematic diagrams formulated show the interdependencies and interconnectedness of the electronic components used.

A series of testing will be done on the system receiver to stabilize the performance of the system. The series of hardware modules will be used on the platform for their compatibility testing and evaluation. The components will be carefully evaluated by noting their weaknesses and strengths. Then the evaluations will be analyzed and considered using Computer-Aided Design (CAD) and other electronic simulation software like DIP TRACE, EAGLE, and PROTEUS. In this period, the components, process orders, and input data will also be finalized within the system.

System Integration and Testing

The project will be designed using IEE802.15b Bluetooth technology that will be combined with a wireless communications transceiver. As a result, the data signals will be sent and saved in a central database server through a local network Wi-Fi Service transceiver application.

In testing the functionality of the system, numerous units of testing will be done to test for the reliability and accuracy of the system. This process also includes system compatibilities for hardware modules embedded with software drivers. Upon the installation and activation of devices, the network functionality will be configured along with the database server and Android devices. Integrating the hardware and the software of the system is the most important key factor to identify the errors in the project.

Testing

The application will be installed into the Android version 6.0 Marshmallow and will meet the software and hardware requirement in a complete network set-up configuration using the receivers and transmitters that will be embedded within the device. Hardware and network connectivity speeds also vary based on the user's location and distances.

Response Time, Reliability, and Accuracy

Since most mobile applications rely on network connections, measuring the performance of the mobile network is very important for the system's functionality of the project. The response time measurements will be calculated in the tests that will be administered on the device with ten samples. Moreover, testing the illuminations span and coverage and utilization of the power throughout the device efficiency will perform its reliability.

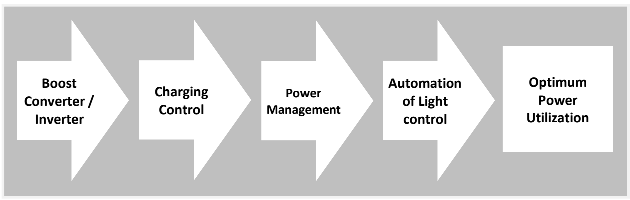

Figure 2. Conceptual Diagram

Optimizing the power consumption will be mainly utilized through the use of PIR (passive-Infrared) sensors which will automatically detect human presence to control the light intensity of the spotlight throughout its operations. If a human or any sudden movement is detected, maximum illumination will be activated, and it will return to its normal illumination when there is no more motion trace. The charging sequence at daylight will be maximized because of the additional storage units provided by capacitors. The sunlight also at the daytime will be used simultaneously to control the sensor supplying the power that acts as a stand-alone system. This is not consuming any amount of power from the gridline to utilize the security lighting system at night. The automatic control will be supported by the mode set-up which has the remote sensing monitoring system and the android application monitoring system which has the capability of controlling the device through wireless technology-Internet of things.

The project will include the development of the lamp post above the rooftop that will be installed in an enclosure protected from dust, rain, and direct heat of sunlight to ensure its components' life span maintenance and functionality. The whole device set-up consists of the interface between the hardware and the software of the prototype to test for its power and the cost efficiency in its implementation.

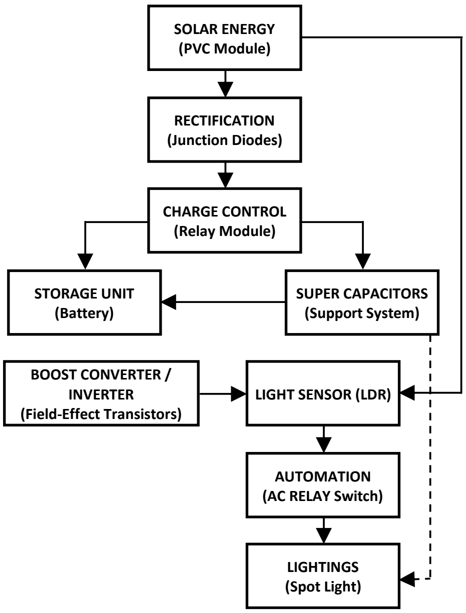

Figure 3. Block Diagram

The hardware design will be constructed mainly from a module controller board that operates to optimize the function of the automatic charging and discharging sequence by light and the electric energy conversion from the prototype. The whole set-up and composition of the following list of components were taken down below which considers the design to consume less power throughout the system operations.

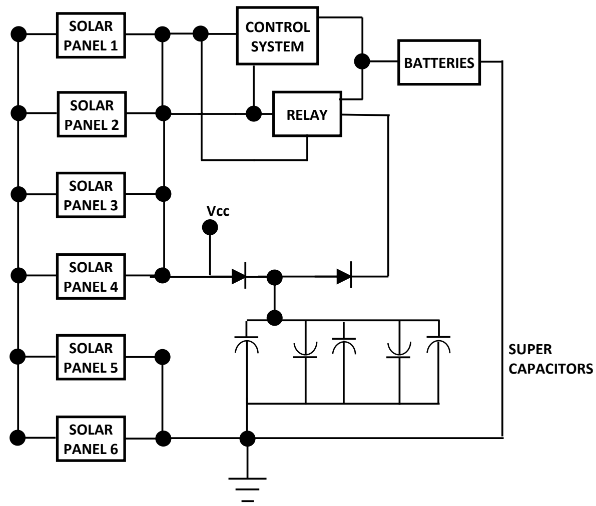

Figure 4. Electronic Hardware Schematic Diagram

RESULTS AND DISCUSSION

Technical Computation Electrical Design Analysis

Daily Power Consumption

$$Device\ Wattage\ x\ Number\ of\ Hours\ Used$$

$$50\ watts\ x\ 12\ hours = 600\ Watts$$

Solar Battery Deep Cycle (Gel Type)

Among other renewable alternative electrical energy sources, solar energy is free and abundant in the surrounding environment that can manage long-term issues in energy crisis (Kannan, 2016). The initial process will be coming from the harnessing of solar energy at daylight with the use of Photovoltaic cells or solar panel arrays designed to sustain enough amount of electricity for the storage of energy and operation of the control system. The control system consists of automation in charging, energy conversion, and light activations. With the continuous flow of energy, this simultaneously supplies power to activate the light sensors and the control system intended to optimize the power consumption of the prototype.

An enhanced storage system will be supported by supercapacitors that have high capacitance values to store more energy and to be fully charged in a short period. It will have the advantage of quick charge, large power density, and long-life cycle. The stored energy will be transferred to the battery which repeats the cycle until the battery will also attain its full charged condition. In terms of recharging rate and life span, a supercapacitor will have a greater advantage than a battery for generating and utilizing the energy of the system even in considering cloudy or rainy days. Then the reserved battery capacity should be 50-60 percent, so therefore there will be an amount of power rating of 600 Watts coming from the initial input power compared to the output. Taken into consideration by Ohm's Law, a rating of 100 ampere-hours by a 12 volts direct current rating will produce a specified amount of 1200 watts of electrical power. In conclusion, there is a fifty percent battery capacity coming from the 600 watts over a 1200 watts initial capacity.

Solar Panel

Using the average 100 Watts mono crystalline at 80 percent efficiency output at 5 hours average sun hours in the Philippines results into 100 X 5 hours equal to 500W multiplies to 80 percent equals to 400 Watts then;

$$\frac{600W}{400W} = 1.5$$

which results into two pieces of 100 Watts solar panels within the design made.

Solar Charge Controller

One of the automated operations will be coming from the charged control sequence of the battery. During the discharged operation at night of the storage unit, an inverter module will be constructed to deliver enough power in lighting up the spotlight until the energy will be drained. The operation will repeat the cycle from charging in the daytime and discharging at the t-time. The limitation of the charge control system was built to have 12A from two parallel mixtures of photovoltaic cells in 12VDC amount produced wherein the maximum power point tracker is a device that chops up and down direct current voltages format. This preserves the match between the panels and the storage units. It would transform a higher scale of energy voltage product from solar panels gong small scales energy voltages needed to charge up the storage units. These are sometimes called "power point trackers" and are not to be confused with panel trackers, which are solar panel mount that follows, or track, the sun.

The optimization characteristics of this control system unit are because photovoltaic cells are spotless wherein panel tracking is where the mount accurately follows the sun. These sums up to enhance the product output captured from the sun across the clouds for maximum sunlight filtering. These normally absorb about a 35 percent increase in summer for tropical countries like the Philippines. In aid of maximum power point tracking solutions, panel temperatures are much lower on rainy days that might put out greater energy, wherein it is the time that the device needs to power up more from the solar panels due to shorter days of sunlight covers.

Maximum Power Point Tracking (MPPT) is a digital tracking device that controls the charging that simultaneously monitors the output of the panels and compares it to the amount of battery voltage. It will detect out what is the perfect fit of power that the panel can put out to charge the primary storage units within the system. Commonly, maximum power point trackers are ranging at 93-97 percent in their power conversion efficiency. It harnesses a 20 to 45 percent power gain in colder days and 10-15 percent in summer days of operations and a continuous cycle of repetition over a while. Actual gain can change possibly due to temperature, weather, charge cycle of battery, and other natural extrinsic and intrinsic factors.

Inverter

The specification included in this device has a 300Watts of load power consumption in maximum range, therefore the load or bulb in the spotlight is rated for 50W. The amount of voltage generated from multiple arrays of solar panels within the storage units will be in the DC form which will require the specification of higher voltage into the high bright lamps. From the battery, a boost converter will amplify the voltage to match the amount needed in the input of the inverter circuit. This design will be adapted from elctroschematics.com and might be modified for some compatibility and availability issues.

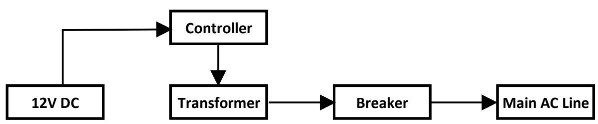

Figure 5. Inverter Hardware Design-DC to AC Converter

DC Breakers

Circuit breakers were included for safety purposes of the system which has the panel to control set-up in 25 Ampere rates, the controller to Load the pathway into 25 Ampere rates, the battery to load set-up with a 32 Ampere rate, and the manual mode set-up with 40 Ampere rates.

Final Hardware Design

The system prototype was built in this wooden platform below with the following components, namely: the solar panels, Gel type 12VDC battery, the maximum power point tracking device which is digital in purpose by its monitoring and control functions, the circuit breakers for safety routing of connection all through-out the circuit hardware design built, the inverter and the lighting system.


Figure 7. Spot Light Set-up with Solar Panels


Figure 6. Prototype Construction Set-up

The loading system is utilized with a light-emitting diode 50 watts rating of the lamp. It initially harnesses solar energy from two (2) parallel solar monocrystalline, photovoltaic cells and transfers energy directly to the controller where the Gel-type battery is connected.

In reference to the data on table 2, the parameters taken into consideration were the readings for the temperature in degree Celsius, Photovoltaic Voltage input ratings as well as the current capacity in ampere-hour rating, the initial charging time, the full-charged time voltage, and the date of conducted trial. These variables were commonly referred to as the common specifications of the charging system for normality check of the hardware and the software functionality. As the average rating is computed over the ten trials, this accumulated an amount of 6.95 hours which represents the rate at which the charging operates at a cloudy day set-up.

Table 2. A 13.7V Full Charging Sequence at Daylight with Rainy Weather Condition

#	Device Temperature Degree Celsius	Solar Panel Voltage(V)	Solar to Battery Current (Ah)	Time Started	Fully Charged Time (Hours)	Date
1	32	18.1	34	5:43:16 am	6.4	11/26/2020
2	37	17.6	38	5:36:11 am	7.1	11/27/2020
3	39	19.2	32	5:41:02 am	7.7	11/28/2020
4	31	20.3	36	5:27:55 am	6.6	11/30/2020
5	36	17.4	29	5:18:09 am	7.3	12/14/2020
6	39	18.5	26	5:22:13 am	7.2	12/15/2020
7	40	19.3	33	5:17:05 am	6.8	12/16/2020
8	33	17.9	34	5:21:08 am	6.7	12/17/2020
9	37	18.7	38	5:13:29 am	7.2	12/19/2020
10	31	17.5	40	5:25:16 am	6.5	12/21/2020
Average	35.5	18.45	34		6.95	

Table 3. A 13.7V Full Charging Sequence at Daylight with Sunny Weather Condition

#	Device Temperature Degree Celsius	Solar Panel Voltage(V)	Solar to Battery Current (Ah)	Time Started	Fully Charged Time (Hours)	Date
1	34	19.9	46	5:33:22 am	5.2	11/24/2020
2	36	18.7	51	5:23:47 am	5.5	11/25/2020
3	38	19.5	48	5:28:13 am	5.1	11/29/2020
4	42	18.6	46	5:11:16 am	5.4	12/11/2020
5	46	21.2	52	5:26:12am	5.8	12/12/2020
6	45	20.6	55	5:09:21 am	5.5	12/13/2020
7	38	20.3	47	5:36:14 am	5.1	12/18/2020
8	39	19.6	44	5:12:24 am	5.2	12/20/2020
9	41	19.8	46	5:22:38 am	5.6	12/22/2020
10	38	18.8	49	5:14:37 am	5.4	12/23/2020
Average	39.7	19.7	48.4		5.38	

As the same parameter applies in reference to the data on table 3, the accumulated average time resulted in 5.38 hours only in the operation of a normal sunny weather condition. This is faster than the rainy condition and still can store energy in varying weather conditions. This generated power from Solar energy maximizes and sustains the cycle of charging simultaneously with the lighting operations at night.

Table 4. Efficiency test of the Light during nighttime

Number of Testing	Date	Time Started Automatic Lights ON	End of Discharge Time Record	Battery Leftover Voltage
1	12/15/2020	6:11:31 pm	6:21:03 am	12.6
2	12/16/2020	6:14:26 pm	6:23:15 am	12.3
3	12/17/2021	6:10:45 pm	6:22:44 am	12.4
4	12/18/2021	6:09:21 pm	6:19:01 am	12.2
5	12/19/2022	6:13:11 pm	6:23:11 am	12.4
6	12/20/2022	6:09:21 pm	6:27:48 am	12.6
7	12/21/2023	6:12:46 pm	6:31:04 am	12.7
8	12/22/2023	6:17:01 pm	6:30:51 am	12.5
9	12/23/2024	6:21:02 pm	6:22:37 am	12.7
10	12/24/2024	6:17:05 pm	6:19:56 am	12.5
	Average	13.3	23.7	12.49
	Average Time	6:13 pm	6:23 am	
Average Operating Hours	**12 hours and 10 minutes**			

In reference to the table 4, the parameters taken into consideration were the date for the conduct of the trials, the initial discharging time at when the light is initially turned ON consuming the stored energy at daylight, the end of the discharging period when the light will be turned off automatically as it already sensed a sunlight t daytime and lastly, the battery left over-voltage these parameters taken were referred to as safety limit for the device life span and capacity limit to operate continuously. Acquiring the average value from the rest of the ten trials, the system continuously operates at night at an average of 12 hours and 10 minutes.

CONCLUSION

Based on the findings, the prototype was built using the MPPT control system, monocrystalline, solar PV cells which can harness energy even when the weather has variated from rainy to sunny days, and a Gel type lead acid 12VDC battery. MPPT control was designed for appropriate functions of the sequence of charging, and the automation that supports turning ON and OFF of the light. The functionality of the system was tested and evaluated in terms of its charging time and accuracy based on the result of charging the full-time voltage of the system when it is on a rainy day set up that has resulted in an average of 6.95 hours. While in the set-up of sunny weather conditions, it got an average of 5.38 hours only, and still, it considers that the system was able to sustain enough power of storage at varying weather conditions.

The discharging sequence wherein the spotlight continuously lights up at night has resulted in an operating full hour of 12 and 10 minutes with an excess average value of voltage into 12.49 Volts. The power output delivered from a photovoltaic module highly depends on the amount of irradiance, which reaches the solar cells wherein many factors determine the ideal output or optimum yield in a photovoltaic module. However, the environment is one of the contributing parameters which directly affects the photovoltaic performance as one observed here was the location of installation wherein the direct exposure of sunlight varies from time to time.

RECOMMENDATION

The operating hours of the spotlight might be maximized in power consumption throughout the use of PIR sensor technology which can only act to consume power when human intervention is detected within the surface covering the area of the facility within the range of the spotlight.

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