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Challenges in Teaching During the Time of Pandemic

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The COVID-19 has spared no one. Both rich and developing countries have suffered badly from it. At the onset of the outbreak in the country, most of the cities and provinces declared ECQ (Enhanced Community Quarantine), thereby restricting the operation of all public transports and business operations that are not categorized as essential services. Classes at all levels were suspended initially for two weeks and were indefinitely extended as the situation did not get better.

In spite of the current situation, classes must proceed according to schedule and therefore school and university administrators have to develop a plan to deliver the courses with minimum to no face-to-face meetings to protect both the instructors and the students. A perceived way of accomplishing this mode of course delivery is through online classes that have to be conducted through both synchronous and asynchronous modalities. However, it should also be recognized that more than 50% of the student population in state universities do not have an internet connection at home, and thus online course delivery may not apply to them. To address this particular need, the administrators of state universities need to consider course delivery through modules. The modules will be prepared by the instructors and mailed to the students.

The shift from the old normal of face-to-face classes to the new normal of remote learning entails many challenges to both instructors and students. On the side of the instructors, the amount of workload involved in the preparation of teaching materials in this new normal situation has doubled compared to the old normal. To cater both groups of students who have internet access and those who do not have, 2 types of teaching materials have to be prepared as compared to the old normal where only one type of teaching material is necessary. This transition to the new method of teaching requires a shift in mindset. This transition will inevitably affect the emotional and psychological aspects of the teachers and thus crucial emotional and psychological scaffolds would be necessary for this new paradigm of teaching to keep the sanity of the teachers intact.

One of the most challenging parts of teaching from home is the increasing blur between work mode and home mode. Maintaining a work-life balance in a teaching career during this time of pandemic is indeed a real struggle. To maintain strong mental health, mechanisms to cope must be seriously considered. With the double amount of workload accompanying the new teaching

modality, it is important to plan activities to curb teacher burnout. It should be recognized that trial and plenty of error are expected, and thus we need not be harsh on ourselves. With everyone still trying to embrace this new normal, it would help reduce the workload considering that students are also suffering and still trying to adjust to this new learning set-up. With everyone working from home, the feeling of isolation can also become serious and may significantly affect the learning process of the students. Hence, reducing the content of a given course may be advisable not to overwhelm the students who may be suffering from feelings of isolation. In the end, it is not how much content is delivered, but it is the quality of learning the students have gained. Most importantly, survival from this pandemic should be the utmost priority of everyone, and it is necessary to stay above the crisis we are currently facing brought about by the unseen enemy while we work towards regaining normalcy.

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Antibacterial Activity of Zinc Oxide Nanoparticles Using Banana Peel Extract against Antibiotic-Resistant Bacteria

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ABSTRACT

Synthesis of zinc oxide nanoparticles on their antimicrobial activity utilizing banana peelings could be a potential candidate to develop nano-formulated natural products as an alternative, efficient, inexpensive, and environmentally safe method with specified properties. The study aimed to investigate the biological synthesis, characterization, and antimicrobial analysis of zinc oxide nanoparticles (ZnONps) against clinical pathogens *Pseudomonas aeruginosa* and *Staphylococcus aureus* using *Musa acuminata* × *balbisiiana* peelings. Data revealed that varying concentration, temperature, and pH level can significantly influence the antimicrobial activity and plays crucial steps in the preparation of ZnONps. Research on nanoparticles as antibacterial agents can have an essential application in the food industry as antibacterial agents in food packaging and foodborne pathogens. Since this study deals with the preliminary investigation on banana peelings locally grown in the Philippines as capping and reducing agent through green chemistry, it can promote the potential application in the Philippine food industry. By proper incorporation of nanoparticles into packaging materials, it may inhibit or cause foodborne pathogens bacterial death

Keywords: antimicrobial, nanoparticles, Musa acuminata × *balbisiiana*.

INTRODUCTION

Nanoparticles research is an emerging field not because of its broad application in biotechnology but is also considered a viable alternative to antibiotics to solve the problem of the emergence of bacterial multidrug resistance (Abbasi et al., 2020; Mahmood et al., 2019; Srikar et al., 2016; Rai et al., 2012). It also opened new horizons in nanomedicine, such as the synthesis of candidate nanoparticles that can be assembled into complex architectures (Franci et al., 2015; Thirumavalavan et al., 2013; Natarajan et al., 2010). With its unique, peculiar morphology and environmentally friendly material desirable for bio-applications, it considerably gets much attention. However, the development of more reliable technology and the use of environmental-friendly procedures to synthesize nanoparticles must also be considered. Thus, the prospect of exploiting natural resources for metal nanoparticle synthesis has become a more competent and eco-friendly approach to explore potential plants to synthesize nanoparticles (Mubayi et al., 2012). Accordingly, plant-mediated nanoparticle synthesis is more preferred because it is more the environmentally friendly, cost-effective, single-step method, and safe for human therapeutic use (Kumar & Yadav, 2009). Different parts of plant materials such as extracts, fruit, bark, and fruit peels have been studied so far to synthesize nanoparticles showing different sizes and shapes (Iqbal et al., 2019; Iqbal et al., 2020). The factors affecting the synthesis of nanoparticles are the reaction temperature, metal ion concentration, extract contents, pH of the reaction mixture,

duration of reaction, and agitation (Srikar et al., 2016).

Banana, as one of the leading fruits grown in the Philippines and a consistent top dollar earner, its peel can represent 36% of the total weight of the fruits and does not constitute an industrial application. Banana peel is an underutilized source of phenolic compounds, a good source of functional foods and antioxidant compounds. In particular, gallocatechin and dopamine can help prevent cardiovascular and neurodegenerative diseases that can neutralize the action of free radicals in the body (Baskar et al., 2011). Utilization of banana peel as reducing and capping agents will be more advantageous over other biological processes because it is non-toxic, cost-effective, eco-friendly, that would be suitable for developing large-scale production. Capping agent plays an essential role in controlling the morphology of nanostructure because of their soft-template effect and their ability to modify the chemical kinetics, while, the reducing agent controls the particle size. The previous study shows that biosynthesis silver nanoparticles (AgNps) using banana peel extract were characterized with uniform, spherical, crystalline, and monodispersed nanoparticles with an average particle size of 23.7 nm (Ibrahim et al., 2015). Moreover, the synthesized AgNps have excellent antimicrobial activity

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showing the synergistic effect of the standard antibiotic levofloxacin against selected pathogenic microorganisms (Ibrahim et al., 2015; Ali et al., 2015). In this study, zinc oxide nanoparticles (ZnONps) were investigated to understand the mechanism of ZnONps using banana peel extracts as an antimicrobial agent.

Pseudomonas aeruginosa and *Staphylococcus aureus* are bacterial strains responsible for the majority of hospital-acquired infections. In the present investigation, banana peel extract was used to investigate how it can mediate a novel route for the green synthesis of ZnONps. The widespread cases of multidrug-resistant bacteria against the standard antibiotics have led researchers to incorporate ZnONps as an ingredient to boost the antibiotic effects potentially.

METHODOLOGY

Microorganisms. *Staphylococcus aureus* and *Pseudomonas aeruginosa* were purchased from Central Mindanao University, College of Veterinary Medicine. Bacterial strains were maintained on nutrient agar slants at 4°C for further use.

Chemicals. Standard metal ion solution, zinc nitrate hexahydrate [$\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$], was purchased commercially from Aldrich prepared in distilled water. Chemicals and reagents used in this study were analytically graded and were used without any further purification.

Banana peels extract preparation. Cardava banana (*Musa acuminata* × *balbisiana*) peels were washed and boiled in distilled water for 30 min at 90°C. The peels (100g) were crushed in 100 ml distilled water, and the extracts were filtered using cheesecloth to remove the insoluble fractions and macromolecules present in the sample. An equal volume of chilled isopropyl alcohol was added, and the resultant precipitate was centrifuged at 1000 rpm for 5 min, suspended in distilled water, and stored in a refrigerator 4°C for further studies. The extract was used as a reducing as well as a stabilizing agent.

Synthesis of zinc oxide nanoparticles using banana peel extract. The reaction mixtures contained 1 ml of banana peel extract (equivalent to 6.8 mg dry weight) in 50 ml of zinc nitrate solution (1 mM). Banana peel extract, zinc nitrate solution, was used as a control, and all experiments

were carried out in triplicates. The effect of the zinc was determined by varying the ZnONps concentration from 0.25 to 2.0 mM. To evaluate the effect of banana peel extract concentration from 0.25 to 3.0 ml was used while keeping the ZnONps concentration at a level of 1.75mM. The effect of pH was also studied by adjusting the reaction mixtures (3 ml banana peel extract at 1.75 mM ZnONps) to 2.0, 3.0, 3.5, 4.0, 4.5, 5.0, or 6.5. The effects of temperature on nanoparticle synthesis were also investigated wherein the reaction mixtures containing 3 ml banana peel extracts and 1.75 mM ZnONps at pH 4.5 were incubated at different temperatures (30, 40, 50, 60, 80, or 100°C) for 5 min. The effect of reaction time was evaluated by incubating the reaction mixtures with optimum composition for 3, 5, 10, 15, 20, 25, 30, 45 min, 1, 24, 48, 72, and 96 h.

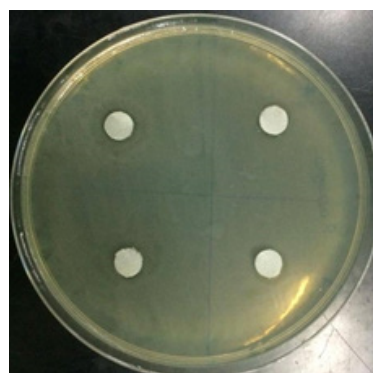
Antimicrobial activity of synthesized zinc oxide nanoparticles. The researchers estimated the antimicrobial activity of ZnONps in terms of the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC). For each bacterial strain, three replicates were used. For MIC determination, 96-well plates containing sterile 200 ul of nutrient broth media, supplemented with various ZnONps concentrations (0.5, 1.5, 3.0, 6.0, and 10 ug/ml) was incubated with 20ul of the microbial culture broth (0.8 OD₆₀₀) and the flask was incubated for 24 h at 37°C. Zinc oxide nanoparticles-free broth media was used as a positive control. The microbial growth index was determined using a UV-Vis spectrophotometer. MBC estimation microbial cultures grown in nutrient broth medium supplemented with ZnONps was inoculated onto nutrient agar plates free from ZnONps and incubated at 37°C for 24 h. The lowest concentration of the nanoparticles that prevent microbial growth was designated as the MBC.

RESULT & DISCUSSIONS

The study aims to investigate the potential use of synthesized zinc oxide nanoparticles (ZnONps) by green chemistry using an extract derived from banana peeling against human pathogenic microorganisms. The purpose of synthesizing nanoparticles using plant material as a potential stabilizing, reducing, and chelating agent, is to determine the therapeutic potential of green synthesis of metallic nanoparticles such as ZnONps. This study will help in environmental issues by determining potential antibacterial sourced from natural products



Staphylococcus aureus



Pseudomonas aeruginosa

Figure 1. Inhibitory effect of banana peeling concentration grown in nutrient agar medium

that are easy, efficient, and eco-friendly against common bacteria that can lead to severe diseases. Figure 1 shows the inhibitory effect of banana peeling against *S. aureus* and *P. aeruginosa* pathogenic bacteria grown in nutrient media 24 hours at 30°C. At minimal concentration, a zone of inhibition (ZOI) was observed in both representative microorganisms that may imply that extracts from banana peeling may have a potential inhibitory effect. Banana peel has an underutilized source of phenolic compounds, which can be considered a good source of functional foods and antioxidant compounds (Baskar et al., 2011). Moreover, secondary metabolites such as flavonoids, tannins, phlobatannins, alkaloids, glycosides, and terpenoids were found in banana peel (Imam, 2011). The presence of these phytochemicals/secondary metabolites might be responsible for the antibacterial activity of banana peel. In the study of Ehiowemwenguan et al. (2014), when banana peel extract was prepared using isopropyl alcohol it dissolves more active compounds and had higher antibacterial activity than the aqueous solution. Therefore, in this study, isopropyl alcohol was used to dissolve more active compounds from the banana peel and might be responsible for its antimicrobial activity (Kadapa et al., 2015).

We then tried to measure the growth rate at OD₆₀₀ of *S. aureus*, and *P. aeruginosa* grew in nutrient broth for 24 hours at 30°C using a spectrophotometer with varying concentrations of ZnONps (Figure 2). The data shows that the addition of ZnONps at different concentrations inhibited the growth rate *S. aureus* and *P. aeruginosa*. This data implies that increasing the level of zinc nitrate is fatal to the growth of the bacterial strains. Accordingly, banana peels are mainly composed of pectin, cellulose, hemicelluloses, and some functional groups associated with these polymers, and the proteinaceous matter may be responsible for reducing the zinc salt to Zn⁰ (Kokila et al., 2015). The biological components of some plants are known to interact with metal salts via these functional groups and mediate their reduction to nanoparticles (Bar et al., 2009; Ganesh Babu and Gunasekaran, 2009; Ibrahim, 2015). The Gram-negative bacteria *P. aeruginosa* showed a maximum zone of inhibition when cultivated for six (6) hours. This may be due to the cell wall structure of gram-negative bacteria that possesses a thinner peptidoglycan

layer compared to the Gram-positive bacteria composed of a thicker peptidoglycan layer. Gram-positive bacterial peptidoglycan consists of linear polysaccharide chains cross-linked by short peptides, thus forming a more rigid structure leading to difficult penetration of the zinc nanoparticle (Shrivastava et al., 2007). The high antimicrobial activity is certainly due to the zinc cations released from ZnONps that act as reservoirs for the Zn⁺ bactericidal agent. The same result in silver nanoparticles was changed in the membrane structure of bacteria resulted from the interaction with silver cations leading to the increased membrane permeability of the bacteria (Dibrov et al. 2002; Iqbal et al., 2019).

To test if the pH level can affect the inhibitory effect of ZnONps, we have tested different pH levels to further produce a larger mass of ZnONps (Figure 3). We have chosen at pH 5 (medium acidic), pH 7 (neutral) and pH 12 (basic). Data shows that at pH 5, higher antibacterial activity was observed at acidic pH levels with the maximum toxicity at pH 5 for *S. aureus* and *P. aeruginosa*, respectively. However, at pH 12, when there are more ZnONps produced, it also showed a greater zone of inhibition effect as compared to acidic with pH 5 or at a neutral level with pH 7. Accordingly, analysis of the results demonstrated that exposure media of ZnONps and cultural factors play a role in their cytotoxic effects (Prasad et al., 2012). It could also be attributed to the principal mechanism at different reaction conditions. The results showed that the overall influence of pH on the antibacterial activity of ZnONps against both bacteria was similar. As the pH increased from acidic to neutral, the percentage of the growth inhibition of both microorganisms decreased. It may suggest a pH-dependent mechanism for ZnONps antimicrobial properties. Synthesized ZnONps size can be tuned with pH variation, and small-sized nanoparticles exhibited higher antibacterial activity. According to the study of Ariz et al. (2019), as the pH increases from 7, particle size starts to increase to a micrometer, and at lower pH like pH4, the particle size is in nanometers. And when keeping the pH low and increasing reaction time, it also gives bigger size particles, but at higher pH by decreasing reaction time, particle size almost remains the same (Ariz et al., 2019). Previous studies also showed that with pH increment, the particle size was observed to be decreased due to increased

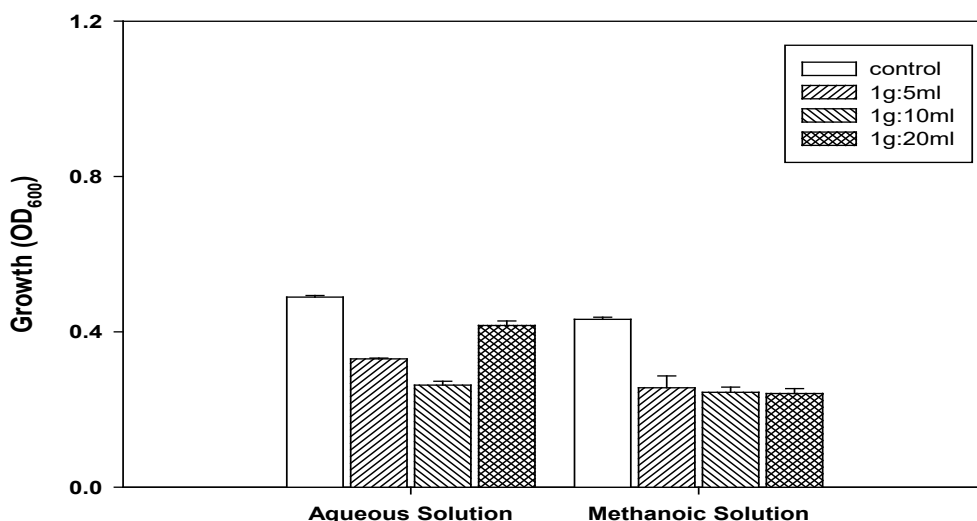


Figure 2. ZnONps at the different concentration tested against in *S. aureus* and *P. aeruginosa*

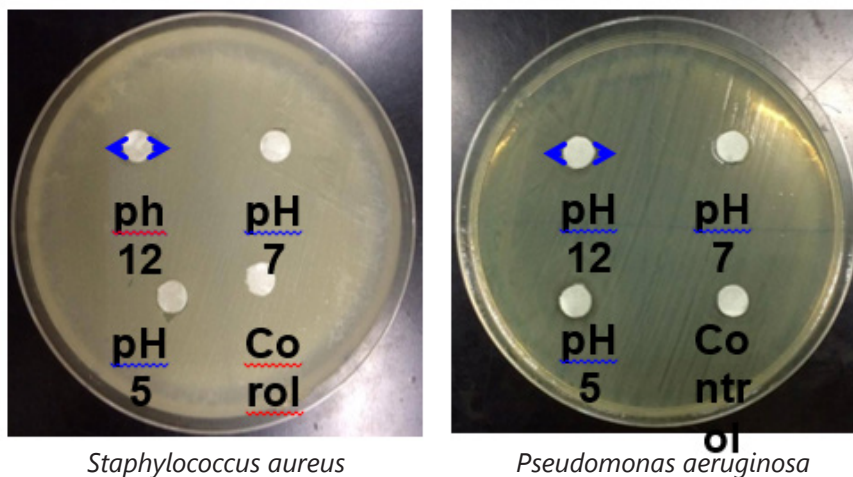


Figure 3. Inhibitory effect of zinc oxide nanoparticles (ZnONPs) at a different pH level

reactivity (Rajesh et al., 2016). At pH values 2.0–4.0, a white precipitate was obtained, and no color change was observed. The varying shades of reddish-brown color were observed at pH values between 4.5–6.5; thus, we used at pH 5 for an antimicrobial test. The highest color intensity was obtained at pH 4.5. In agreement, Roopan et al. (2013) reported that at pH 2.0, no reaction occurred, while at pH 11, highly monodispersed nanoparticles were obtained with an average size of 23 ± 2 nm accordingly. A variety of biomolecules are postulated to be involved in biological nanoparticle synthesis, and such biomolecules are likely to be inactivated under extremely acidic conditions (pH 2.0). The differences in the colors obtained over the range of pH could be ascribed to a variation in the dissociation constants (pKa) of functional groups on the biomass involved (Pimprikar et al., 2009).

The temperature also affected the process of zinc reduction ((Figure 4). Reaction mixtures that were incubated at 30, 40, and 50 °C showed a light reddish-brown color. At higher incubation temperature (60, 80, and 100 °C), the filtrate showed a dark reddish brown color. At room temperature (30 °C), the color change took 10-20 min to develop. Heating the reaction mixtures at 40–100 °C, the reduction process was faster, and the reddish-brown color was developed within 5 min. The incubation time of the reaction mixture was directly proportional to the intensity of the color change. Interestingly, when *S. aureus* and *P. aeruginosa* were grown in NB medium supplemented with

ZnONPs at 1.75 mM at pH 5, the *S. aureus* has significantly decreased as compared with *P. aeruginosa*.

CONCLUSION

In this study, banana peels were successfully utilized for the consistent and quick synthesis of zinc nanoparticles. The biosynthesized ZnONPs using banana peel extracts revealed good antimicrobial activity against the selected pathogenic microorganisms. This green synthesis approach showed to be a cost-effective, non-toxic, and eco-friendly alternative to a conventional microbiological application. It would be suitable for developing a biological process for large-scale production. The ZnONPs were produced by using of zinc nitrate with peel extract in aqueous media without any external human-made chemicals. The reaction pathway satisfies all the conditions of a 100 % green chemical process. These zinc nanoparticles may be used in the effluent treatment process for reducing the microbial load.

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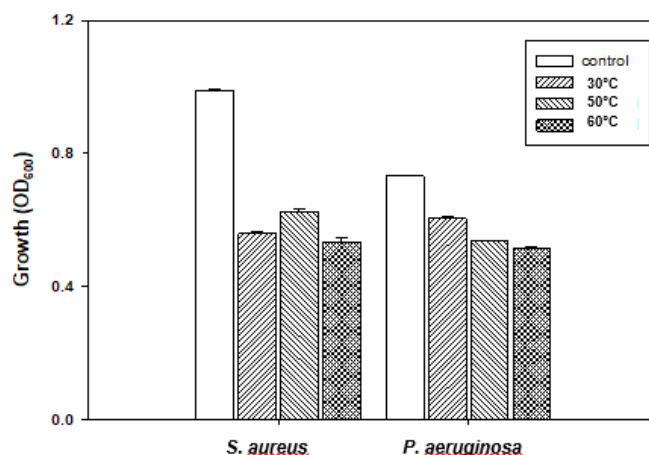


Figure 4. Growth performance of *S. aureus* and *P. aeruginosa* in ZnONPs prepared at different temperature

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Utilization of Cogon (*Imperata cylindrica* L.) Silage and Urea-Treated Corn (*Zea mays* L.) Stover as Affected by Supplementation

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ABSTRACT

Cogon grass, a weed occasionally used as livestock feed, has limited nutritive value. Improving the utilization of low-quality roughages could be by treatment with nitrogen sources, chemical, and physical treatment. Thus an experiment was conducted to assess the voluntary intake and digestibility *in vivo* of cogon silage and urea-treated corn stover as affected by varying ratios of concentrate: Ipil-Ipil leaf meal (ILM) supplementation in goats. The experiment was set-up in a Randomized Complete Block Design (RCBD) with four (4) blocks based on sex-period combination with a 2x3 factorial treatment design: factor A with two types of base forage (cogon silage, urea-treated corn stover), and factor B with three (3) ratios of concentrate: ILM as a supplement (1.25:0; 0.75:0.50 and 0.50: 0.75 %BW, DM basis). Results revealed a comparable voluntary intake and *in vivo* digestibility of cogon grass silage and urea-treated corn stover across three types of supplements, and among supplements across types of basal diet. Interaction between the kind of basal diet and type of supplement was not significant. It is, therefore, advantageous to mix ILM with concentrate at 0.75%:0.50% BW or 0.50:0.75% BW ratio, DM basis, as a supplement to either cogon silage or urea treated corn stover rather than given an all-concentrate supplement at 1.25% BW, DM basis, to save on feed cost.

Keywords: *In vivo*, urea-treated, silage, concentrate: Ipil-ipil supplement

INTRODUCTION

Ruminants in tropical countries are raised predominantly on pasture grasses and crop residues, which are inherently poor in nutritive value and digestibility, especially in the dry season (Babayemi and Bamikole, 2009). During the rainy season, natural pasture tends to be more succulent, highly nutritious, and more abundant. Still, during the dry season, the native vegetation becomes fibrous, scarce, and devoid of most essential nutrients which required for the increase in rumen microbial fermentation and improved animal performance (Sowande, 2004; Lamidi, 2009). The most common native vegetation is cogon grass (*Imperata cylindrica* L.), which grows all over the Philippines and is readily available all year-round in more than half of the 5 million hectares of grasslands. This species is traditionally used as a roofing material but could be used as feed for ruminants during periods of drought (Samson and Capistrano, 1982), especially at a stage of fine leaves through frequent burning and grazing, or cutting (Yunus et al. 2000). Its use as animal feed, however, could be limited because of low digestibility if grazed or harvested at a stage when its cell wall becomes highly lignified and, consequently, low voluntary intake.

Fibrous crop residues (e.g., rice straw and corn stover) are also abundant during the dry season when good quality forages are scarce. There are a lot of unutilized crop residues, but their quality is associated with lignified nature, which limits intake, digestibility, and overall utilization (Olafadehan and Adewumi, 2009). Some ways of

improving digestibility and, consequently, intake have to be instituted, including physical, chemical, and biological treatments (Wanapat et al. 2013). The use of alkali, such as urea (McDonald et al. 2002; Nguyen et al. 2012), and supplementation, such as concentrates and high-quality forages (Jackson, 1979), or both (Bestil, 2009) have been used to improve the feeding value of crop residues.

Optimizing the use rather than improving the nutritive value of such feedstuffs in ruminants implies using treatments that will enhance digestibility and the quality of the roughage through appropriate supplementation and feeding techniques. The utilization of poor quality cogon that is nutritionally enhanced by ensiling, and corn stover (*Zea mays* L.) by urea treatment and supplementation has not been fully documented in Cebu Province. Hence, this study conducted to compare the voluntary feed intake and *in vivo* digestibility between cogon silage and urea-treated corn stover as affected by supplementation of pure concentrate or concentrate + ipil-ipil leaf meal (ILM); and determines the type of supplement of varying concentrate: ILM ratios fitting for cogon silage or urea-treated corn stover.

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MATERIALS AND METHOD

Time and Place of the Study

The experiment was conducted at Cebu Technological University-Barili Campus, Cagay, Barili, Cebu, Philippines, while laboratory analyses were conducted at the Animal Nutrition Laboratory of Department of Animal Science - College of Agriculture and Food Science-Visayas State University, Visca, Baybay, City Leyte, Philippines from December 2018 to April 2019.

Preparation of Experimental Diets and Animals

In this study, corn stovers were collected from cornfields after the grains harvested at 100 days old, situated in Cagay, Barili, Cebu, Philippines. They were chopped to approximately 3-4 cm long and sprayed with urea solution (40-50 grams urea dissolved in 1 L water sprayed onto 1 kg corn stover). The treated corn stover was then covered for (3) three days to prevent the volatilization of ammonia, enabling it to act on the lignin-cellulose bonding.

The cogon grass was gathered early in the morning from the pasture area about 20-25 days after the last cutting. Freshly-cut Cogon was wilted to 60-75% dry matter (DM) and chopped to 2-3 cm long. Urea-molasses was used as silage additive to the cogon grass at 2.1% of silage mass, with molasses added at five (5) times higher than that of urea (Ubod and Bestil 2018). The silage material was compacted, then the air was withdrawn from the plastic silage bags, and stored in a room temperature of about 27-30°C inside a 200-litre plastic drums, with clamp lid, and harvested after 21 days.

The supplemental concentrate was formulated to contain 14% CP, composed of 37.5% cassava meal, 15% rice bran, 25% corn grits, 22% soybean meal, and 0.5% of salt. Ipil-ipil leaves were freshly harvested at the flowering stage, sun-dried for a day to contain about 86-90% DM or 10-14% moisture content, ground, and stored in sacks.

Twelve (12) healthy grower hybrid goats, six (6) females and six (6) males, aging 4-5 months, and weighing 8-11 kg live weight, were used in this study. They were dewormed with Ivermectin and administered with B-complex vitamins beforehand and were randomly assigned to the dietary treatments in two runs with two blocks per run. The experiment was laid out in Randomized Complete Block Design (RCBD), replicated four (4) times with four (4) blocks based on a sex-period combination, for the following treatment in a 2x3 factorial design: Factor A (Types of Forage): A1- Cogon Urea-Molasses Silage and A2 – Urea-Treated Corn Stover; Factor B (Types of Supplementation): B1 - Concentrate (1.25% BW, DM basis), B2 - Concentrate: ILM (0.75:0.50% BW, DM basis) and B3- Concentrate: ILM (0.50:0.75% BW, DM basis).

Collection and Measurements of Fecal Output

Feces were collected manually from each animal throughout the day during the collection period and were kept in individual nylon bags to avoid the loss of volatile nitrogen and contamination of dirt and urine. Feed offered

and refused were recorded daily during the duration of the experiment. Refusals were removed and weighed before the morning feeding. During the digestibility trial, refusals were removed daily, weighed, sampled, and bulked in individual bags. The total quantity of feces voided was weighed and recorded in every animal. About 10% of feces were mixed every day from each animal. At the end of the collection period, the fresh feces were compiled together, and oven-dried and were used for percent dry matter analysis.

In vivo Digestibility Trial

The digestibility trial was conducted at 90% ad libitum intake to prevent bias of digestibility measurements towards the leafy portion of the base diets as follows: Day 1 to 5 gradual shifting from the previous diet to treatment diets; Day 5 to 25 (Adjustment period), this is the period the treatment diets fed at ad libitum (free choice) by giving 20% allowance based on the previous day's voluntary intake, initial weight determined on Day 5 before feeding and weekly monitoring of weight changes and Voluntary Feed Intake (VFI); Day 26 - 29 (Digestibility Trial), reduce basal diet offering to 90% of Ad libitum intake to prevent bias of digestibility measurements towards the leafy portion of the corn stover and cogon grass; and day 30-35 (Collection period), recording of fecal output, feed intake, sampling of feces, and feeds for analysis in Days.

Chemical Analysis

Feed and fecal samples were analyzed for its dry matter (DM), organic matter (OM) contents, and neutral detergent fiber (NDF) according to the methods of the Association of Official Analytical Chemists (AOAC 1990) at the Animal Nutrition Laboratory of the Department of Animal Science - College of Agriculture and Food Science-Visayas State University, Visca, Baybay, City, Leyte, Philippines.

Data gathered and analyzed included:

1. Voluntary DM Intake

For concentrate, ILM and urea-treated corn stover:
 $DMI = \text{Feed Intake} \times \% \text{ DM of feed}$

For silage:

$$DMI = (\text{Feed Given} \times \% \text{ DM of feed given}) - (\text{Feed Refused} \times \% \text{ DM of feed refused})$$

2. Dry Matter Degradation (DMD)

$$DMD (\%) = \frac{(\text{Dry Matter Intake} - \text{Dry Matter Excreted})}{\text{Dry Matter Intake}} \times 100$$

Where: DM Excreted = Fecal Output x % DM of feces

3. Organic Matter Intake

$$OMI = \text{DM Intake} \times \% \text{ OM of feed}$$

4. Organic Matter Digestibility

$$\text{OMD (\%)} = \frac{\text{Organic Matter Intake} - \text{Organic Matter Excreted}}{(\text{Organic Matter Intake})} \times 100$$

Where: Organic Matter Excreted = Fecal DM Output x % OM of feces

5. Neutral Detergent Fiber Intake

$$\text{NDFI} = \text{Dry Matter Intake} \times \% \text{ NDF of feed}$$

6. Neutral Detergent Fiber Digestibility

$$\text{NDFD (\%)} = \frac{(\text{NDF intake} - \text{NDFI excreted})}{(\text{NDF intake})} \times 100$$

Where: NDF Excreted = Fecal DM output x % NDF of feces

DATA ANALYSIS

Data were analyzed by two-way Analysis of Variance (ANOVA) for a Randomized Complete Block Design, and comparison of treatment means was done using the Honestly Significant Difference (HSD) Test with the Statistical Package for Social Sciences (SPSS) version 20 software.

RESULTS AND DISCUSSION

Dry matter Intake and Digestibility

Table 1 presents the dry matter intake and dry matter digestibility from both the basal diet (cogon silage and urea-treated corn stover) and different levels of concentrates. DMI is expressed as % BW in terms of the types of diet and types of concentrate. As shown in the table, there were no significant differences in Dry matter intake (DMI, grams) and dry matter digestibility of goats in terms of the type of forage and type of supplementation. This means that cogon grass silage and urea-treated corn stover and the different types of supplementation have a comparable effect in terms of the dry matter intake. The

Table 1

Voluntary Intake and Nutrient Digestibility of Cogon Grass Silage and Urea-Treated Corn Stover with Varying Types of Supplementation in Goats

TREATMENTS	DMI (g)	DMI (%BW)	DMB (%)	OMI (g)	OMD (%)	NDFI (g)	NDFD (%)
Factor A (Types of diet)							
A1 - Cogon Silage	388	4.03	21.39	423	83.57	291 ^a	43.70
A2 - Urea-treated Corn Stover	331	4.24	20.96	361	84.09	241 ^b	51.85
<i>p-value</i>	0.056	0.650	0.598 ^{ns}	0.058	0.616 ^{ns}	0.030	0.295 ^{ns}
Factor B (Types of supplementation)							
B1 - Concentrate: ILM (1.25:0% BW,DM)	344	4.01	19.23	375	85.31	241	48.15
B2 - Concentrate: ILM (0.75:0.5% BW,DM)	373	4.43	22.37	404	82.67	284	45.86
B3 - Concentrate: ILM (0.5:0.75% BW,DM)	362	3.97	21.93	398	83.50	272	49.30
<i>p-value</i>	0.827	0.323	0.118 ^{ns}	0.890	0.117 ^{ns}	0.500	0.761 ^{ns}
Interaction (AxB)							
<i>p-value</i>	0.294	0.316	0.110 ^{ns}	0.293	0.085 ^{ns}	0.416	0.517 ^{ns}

Means within a column of the same letter-superscripts are not significantly different.

highest DM intake was achieved by goats supplemented with cogon silage added with 0.75% concentrate and 0.5% Ipil-ipil leaf meal. Clearly, the results show that the addition of 75% commercial concentrates compounded to contain complete nutrients, and the additional legume meal improved the DM intake. The combination of a higher amount of commercial concentrates and a lesser amount of Ipil ipil leaf meal given to the animals directly correlates to the DM intake.

The results are in consonance with the study about nutrient digestibility of ensiled sweet corn hob. The digestibility coefficients in ESCH were low (p-value > 0.05) in all the nutrients, and supplementation of Ipil - Ipil leaves in ESCH increased digestibility coefficients. Total digestible nutrients (TDN) and digestible energy were higher in the silages supplemented with ipil - ipil leaves (Sruamsiri et al. 2007). This might be due to the supplement of ipil - ipil leaves in the silages, which provided more nutrients, especially nitrogen, for microbial growth and activities. Ipil-ipil (*Leucaena leucocephala* L.) feed, due to its excellent palatability, digestibility, the balanced chemical composition of protein and minerals, low fiber content, and moderate tannin content can promote to achieve better by-pass protein value ipil-ipil can be a suitable replacement for expensive concentrate ingredients in feed. It is rich in all kinds of nutrients required by goats to provide a goat with better DM intake, weight gain, and reproductive performance (Akingbade et al. 2002 and 2004; Kanani et al. 2006).

The fiber component is also a significant fraction of the dry matter (DM). In many instances, the fiber content of leaf meals may equal or exceed CP concentrations. Consequently, the digestibility of the CP fraction of many leaf meals is low, which tends to depress overall CP digestibility when leaf meals constitute a significant proportion of the diet (Tangendjaja et al. 1990).

Dietary inclusion rates will depend to a significant extent on the protein sources they are intended to replace.

Thus the replacement value of leaf meal is relatively low in diets based on good quality protein sources such as soybean and fish meal.

Organic Matter Intake and Digestibility

Table 1 also presented the effects on the organic matter (OM) digestibility values. OM digestibility is defined as the proportion of organic matter in the feed that is apparently digested in the total ruminant digestive tract. OM digestibility can be used to measure the energy available and to estimate the microbial protein synthesis in the rumen (Anam et al. 2017). Data shows that there were no significant differences found in all treatments, meaning their effects are comparable.

Supplementation is strongly recommended to mitigate the nutritional weaknesses of roughage. In ruminants, when milk or meat production is desired, the low nutritive value of roughage must be supplemented with both protein and energy sources for better growth and improves consumption and increases energy intake (Jackson, 1979); thus, the comparable effects of pure commercial concentrate supplementation plus ensiling and urea treatment of the experimental diets.

Feeding protein or non-protein nitrogen (NPN) in concentrate could increase feed intake, digestibility, microbial protein production, and rumen fermentation efficiency; thereby, improving the performance of ruminant fed low-quality roughages (McGuire et al. 2013; Khattab et al. 2013).

Urea is a good source of NPN that can effectively be used as a source of supplemental N to ruminants consuming low-quality roughages with increasing of voluntary feed intake, nutrient digestibility, a passage from the rumen, and rumen ecology (Cappelozza et al. 2013; Sweeny et al. 2014; Benedeti et al. 2014; Holder et al. 2015; Kang et al. 2015; Ampapon et al. 2016). Urea is used as the building block for the production of protein by rumen microbes, thus its comparable effects with other treatments.

Moreover, urea is commonly added to the ruminant diet as a source of non-protein nitrogen that is rapidly hydrolyzed to ammonia in the rumen. Therefore, it is apparent that the nutritional quality of maize stover is poor, and maize stover should be fed along with the concentrate to maintain the health and increase the milk production potential of milch animals. The concentrates will provide the required concentration of protein as well as other nutrients. Urea treatment on the nutritive value of roughage is the result of two processes that occur within the treated forage: Firstly, the ureolysis, which turns urea into ammonia through an enzymatic reaction that requires the presence of the urease enzyme and secondly, the effect of ammonia on the cell walls on the forage. Several factors, such as urea doses, moisture, temperature, affect the effectiveness of urea treatment. The nutritional quality of urea treated maize stover is drastically enhanced compared to normal stover. The increased microbial biomass in the treated stover may contribute significantly towards higher crude protein content (Elias and Fulpagare, 2015), wherein results revealed that urea treatment of maize

stovers seems to be useful to improve the crude protein content of maize stover.

Supplementation of locally available leguminous forages with commercial concentrate mixture can be a good option for successful goat farming as legumes can be a good source of protein.

Neutral Detergent Fiber Intake and Digestibility

Table 1 presents the results of the neutral detergent fiber (NDF) analysis. Neutral detergent fiber digestibility is a good indicator of fiber content in forages. It does not, however, measure how digestible that fiber is. In vitro NDF digestibility gives us more accurate estimates of total digestible nutrients (TDN), net energy (NE), and feed intake potential. In general, increased NDF digestibility will result in higher digestible energy and forage intakes.

The table shows that there a significant difference in terms of the kinds of diets. However, there were no significant differences observed in terms of types of

IMPLICATIONS

The experiment on intake and in vivo digestibility of cogon grass silage and urea-treated corn stover supplemented with varying ratios of concentrates, and Ipil-ipil leaf meal implies the following: the utilization of cogon and corn stover as ruminant feed should be maximized, especially in the Province of Cebu where soil characteristics cannot support the production of high-quality grasses/forages for a vibrant and booming livestock industry because of better markets; the maximum utilization requires alkali treatment (e.g., urea) of fibrous feeds (e.g., corn stover) and processing (e.g., silage-making) of native grasses (e.g., cogon) harvested at an age when digestibility is highest to prevent further lignification; and the maximum utilization of cogon grass silage and urea-treated corn stover can be stretched further with supplementary feeding, utilizing locally available concentrated ingredients and legume leaf meals (e.g., ILM) in appropriate ratios to minimize feed cost and prevent "substitution effect."

CONCLUSION

Cogon grass in silage form is comparable to urea-treated corn stover in terms of intake and digestibility. Mixing ipil-ipil legume leaf meal with concentrate at 0.75:0.5 ratio or 0.5:0.75 % BW, DM basis, as a supplement to either cogon silage or urea treated corn stover, was comparable to an all-concentrate supplement at 1.25% BW, DM basis.

RECOMMENDATION

It is recommended to process cogon into silage, treat corn stover with urea, and supplement with a mixture of concentrate and Ipil-ipil leaf meal rather than all-concentrates to reduce supplement cost.

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Disaster Risk Reduction Management in Carcar Central Elementary School Cebu City

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ABSTRACT

School children are the most vulnerable group in times of disaster, and empowering them to prepare for and respond to a disaster is imperative. Creating a culture of safety in school is one of the aims of any educational institution, and Disaster Risk Reduction Management (DRRM) is its key. This study aims to determine the Disaster Risk Reduction Management in a public elementary school in Carcar City. A descriptive survey method was utilized in this study, where 71 respondents comprising administrators, teachers, PTA officers, and student leaders were involved. Instruments used were the School Emergency and Disaster Preparedness Level of Knowledge, Level of Implementation, and an Interview Guide for the Focused Group Discussion, which dealt with the challenges and opportunities in implementing DRRM. Findings revealed that the respondents' level of knowledge is only "fair" while the level of implementation is at "low extent" only. Their insufficient awareness of different DRR measures leads to its implementation, not an impressive one. This was attributed to various challenges and barriers that hinder its effective implementation. They were not that familiar with their roles and responsibilities as the actors in the program implemented. Therefore, it is recommended that the proposed action framework, crafted by the researcher and the rest of the school's DRR team, and with the participation of CDRRMO and the barangay captain, be utilized.

Keywords: action framework, a culture of safety, implementation level, knowledge level

INTRODUCTION

Children are the most vulnerable group when disaster strikes in school. Schools should ensure the safety of these children by exposing them to various disaster risk reduction measures to empower them to prepare for and respond to disasters. According to studies, there are 175 million children who are likely to be affected by natural disasters each year. Boon & Pagliano (2015) said that children's vulnerability might be reduced when they are provided with opportunities to participate in disaster preparedness and response activities and access personal and communal support. Therefore, schools play a vital role in preparing children to become more resilient to disasters.

The Philippines experienced two most destructive calamities- the 7.2 magnitude earthquake in Bohol, which affected 275,855 school children, and the mega-typhoon Yolanda (Haiyan), which affected 1.4 million school-aged children. (UNICEF, 2013) According to the Global Risks 2014 Report, World Economic Forum, the significant number of casualties could have been remarkably reduced if the community had understood and prepared enough for disasters. Having adequate awareness of hazards is very significant to be self-reliant. As mentioned by Paño et al. (2014), preparedness is the key to safety. The culture of school safety in the Philippines is translated through Republic Act No. 10121 or the Philippine Disaster Risk Reduction and Management Act of 2010.

However, it has been observed that the Disaster Risk Reduction Management (DRRM) in most of the public elementary schools seems to be one of its weak points.

Though a lot of programs and pieces of training have been conducted to make schools much safer, still many schools are prone to disasters, and that addressing the issue of safety is less prioritized. School children have the right to be both safe and secured in school. Paño (2014) said that the foremost desire of every stakeholder is to ensure the safety and well-being of the children while in school. The Mines and Geosciences Bureau (MGB) 7, an agency under the Department of Environment and Natural Resources, designated cities in Central Visayas that are highly susceptible to landslide and flooding, and Carcar City is one of the identified towns in Cebu. The city was hit by Typhoon Seniang last December 29, 2014, and brought much damage to the entire city. The city is composed of 49 public schools, both elementary and high schools. Carcar Central Elementary School is situated near a river, that poses a high vulnerability to school children in case of a calamity.

The said typhoon damaged the school's parameter fence and a lot more of the classrooms, essential documents in the school were not also retrieved. The necessity of disaster risk reduction management deems it indispensable for the safety of the school community. However, the schools do not have a Disaster Risk Reduction Management (DRRM) manual yet. It is in the preceding situation that this study was conceptualized. It seeks to

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determine the DRRM in Carcar Central Elementary School with the hope of providing a workable action framework.

Thus, it is interesting to determine the Disaster Risk Reduction Management in Carcar Central Elementary School, Carcar City Division, this School Year 2018 – 2019. The basic questions then would be: First, what is the respondents' level of knowledge on Disaster Risk Reduction Management regarding prevention and mitigation, preparedness, response, recovery, and rehabilitation? Second, What is the level of implementation of Disaster Risk Reduction Management in terms of the areas mentioned above? Third, What are the challenges and opportunities in the implementation of DRRM?; and lastly, Based on the findings, what action framework may be designed?

METHODOLOGY

The study was conducted at Carcar Central Elementary School, Carcar I of Carcar City Division, located in P. Nellas St., Poblacion III, Carcar City. The school is situated near a river that is considered one of the flood-prone areas in the said city. This poses a high vulnerability and hazard in case of a calamity such that last December 29, 2014, the said school was devastated by Typhoon Seniang, as the river overflowed.

This study employed a descriptive survey method of research since it aims to describe the level of knowledge, its level of implementation, and the challenges and opportunities encountered in implementing DRRM. Qualitative questions were also formulated to gather the needed data to identify the problems and prospects of the said program and validate the qualitative aspect of the study.

The respondents of the study were chosen using purposive sampling. It covered some of the Division Office personnel like the Schools Division Superintendent of Carcar City Division and the Division DRRM Focal Person. This study's target school was the Carcar Central Elementary School, with its school principal, school DRRM coordinator, classroom teachers, and student leaders.

Research Instruments

Primary data were utilized in this research. A

Table 1

Level of Knowledge on DRRM

Thematic Areas	Mean	Level
Mitigation and Prevention	2.63	Knowledgeable
Preparedness	1.90	Fairly Knowledgeable
Response	2.51	Knowledgeable
Rehabilitation and Recovery	1.68	Fairly Knowledgeable
Average Weighted Mean	2.18	Fairly Knowledgeable

Legend:

4.50-5.00 = Very Much Knowledgeable
3.50- 4.49 = Very Knowledgeable

2.50-3.49 = Knowledgeable
1.50-2.49 = Fairly Knowledgeable

1.00-1.49 = Not Knowledgeable

School Emergency and Disaster Preparedness Level of Implementation Instrument using the Likert scale was used in the entire study to assess the level of implementation on DRRM of the school community. It is an instrument adapted from the study of Paño in 2014 entitled "Disaster Risk Reduction Management: A Push for Institutional Safety, Resiliency, and Sustainability." It is a ten-page instrument answered by the various sectors of the school, focusing on the four thematic areas of disaster risk reduction management, namely: Prevention and Mitigation, Disaster Preparedness, Response and Rehabilitation, and Recovery. It used of a five-point Likert scale that, aims to determine the disaster risk reduction level of implementation of Carcar Central Elementary School. The five-point Likert scale signifies the various extent of implementation with the following interpretations: 5 – very high extent; 4 – high extent; 3 – average; 2 – low extent, and 1 very low extent.

For the level of knowledge and the challenges and opportunities encountered in implementing the DRRM, researcher-made questionnaires were designed. The said questionnaires were patterned on the previous instruments discussed above. The level of knowledge questionnaire is a six-page instrument that also uses a Likert scale with the following interpretations: 5 – very much knowledgeable; 4 – very knowledgeable; 3 – knowledgeable; 2 – fairly knowledgeable and 1-not knowledgeable at all.

Qualitative questions were also formulated to verify data in identifying the said program's challenges and prospects and validate the qualitative aspect in the study. This method can make a detailed description of the existing phenomena, and justify current conditions and practices to create a solution for improvement. The respondents answered the 15 DRRM indicators stipulated in the interview guide during the focused-group discussion about the challenges and opportunities. Respondents were encouraged to give their feedback and suggestions about the different factors along with the four thematic areas of DRRM.

The research instruments were checked and verified by the experts from Disaster Risk Reduction, Dr. Jennifer Paño, Dr. Erik Remoroza, and Dr. Isabelo Genegaboas. These three experts were affiliated with Cebu Normal University.

RESULTS AND DISCUSSION

There are four thematic areas in disaster risk reduction in the Philippines. These include 1) prevention and mitigation, 2) preparedness, 3) response, and 4) rehabilitation and recovery.

Table 1 shows that the respondents were knowledgeable in mitigation and prevention as it got a weighted mean of 2.63. They have enough knowledge about the different measures that will lessen the adverse impacts of disasters that may come. Likewise, they were knowledgeable on the engineering techniques that the school must have. This knowledge may be attributed to their active participation in the training conducted by the Department of Education.

In Disaster Preparedness, respondents perceived themselves to have a fair knowledge since it has only a mean of 1.90, which means that they were a little aware of the things that ought to be prepared in the event of a calamity. This may be because a few teachers and staff could attend pieces of training, and that information was not completely cascaded to everyone. Hence, the school community lacks awareness, which is necessary to build a culture of safety in school. This negates the study of Paño et al., which stated that the key to safety is preparedness.

As to disaster response, the respondents in this study perceived to be knowledgeable as it got a mean of 2.51, which means that they have adequate awareness regarding disaster response measures. This means that the constant conduct of emergency drills and involving everyone as the key actors helps them gain the basic knowledge on how to respond in a disaster.

However, the respondents' knowledge is limited to the area of preparedness and rehabilitation, and recovery. This may mean that the school community lacks involvement in executing roles and responsibilities in the implementation process. Many of disaster measures need to be introduced in depth for them to execute what they are supposed to.

To sum-up, having only a fair knowledge of

DRRM implies that the children in school are not secured when disaster strikes. One of the goals stipulated in Comprehensive School Safety is to protect students and educational personnel from death and injury in schools. Apart from this, children should be empowered to become self-reliant. Hence rigid training for all school personnel is recommended to acquire basic knowledge on DRR. As stated by Weichselgartner & Boon (2015), knowledge is required in incorporating different DRR measures.

Disaster Risk Reduction Management encompasses the four areas. As presented in the above table, the four areas of DRRM were implemented to a low extent. Hence, the implementation process is not impressive. However, for the school to have a successful outcome, the school personnel should have adequate awareness regarding the entire area. The awareness will serve as the baseline for its implementation.

The school's overall implementation on DRRM as perceived by the respondents under mitigation and prevention got only a weighted mean of 2.19, which corresponds to a low extent. This may be because the school is just newly guided and has just participated lately in different DRR training. Thus, a great performance is not expected but should and must be improved.

Same with its disaster preparedness, a low extent in its implementation implies that the school's emergency and disaster preparedness plan is not effectively executed. The school community is ineffectively performing their roles and responsibilities. This may be attributed to the fact that school personnel was bombarded with so many functions in the department. Moreover, executing one's responsibilities without a deep understanding of its vision and value may also be the reason for this. As suggested by UNISDR (2010), teachers should take an active role in DRRM since they are always in contact with the students. Thus, it is a great challenge to every administrator to heighten teachers' motivation in performing such responsibilities and involving every teacher to participate in training.

In the area of disaster response, which has the highest mean of 2.47, though it was still implemented to a low extent, the school has great gaps to be addressed

Table 2

Level of Implementation of DRRM among the Four Thematic Areas

Thematic Areas	Mean	Level
Mitigation and Prevention	2.19	Low Extent
Preparedness	2.03	Low Extent
Response	2.47	Low Extent
Rehabilitation and Recovery	2.32	Low Extent
Average Weighted Mean	2.25	Low Extent

Legend: 4.50-5.00 = Very High Extent
 3.50- 4.49 = High Extent
 2.50-3.49 = Average
 1.50-2.49 = Low Extent
 1.00-1.49 = Low Extent

Table 3
Challenges and Opportunities in Implementing DRRM

Thematic Areas	Challenges	Opportunities
Mitigation and Prevention	<ul style="list-style-type: none"> *determining role and responsibilities *limited space *insufficient budget *difficulty in several areas 	<ul style="list-style-type: none"> *more avenues to explore and learn *to be more creative *inclusion of DRRM in SIP *experience and gain a new idea
Preparedness	<ul style="list-style-type: none"> *various posters as a mean of communication were posted *alternate emergency warning system cannot be heard throughout the whole campus *unavailability of materials/ equipment 	<ul style="list-style-type: none"> *improve a partnership with stakeholders and agencies * utilizing available materials *explore various methods
Response	<ul style="list-style-type: none"> *gaps in evacuation procedure considering the large population with the open space 	<ul style="list-style-type: none"> *seek and create partnership with other agencies
Recovery and Rehabilitation	<ul style="list-style-type: none"> *lack of experience in the actual conduct of environmental assessments *time constraints 	<ul style="list-style-type: none"> *developing the linkages among partners

to improve in its implementation process. This further implies that conducting regular emergency drills is not enough to ascertain that the school is disaster responsive. Nevertheless, if the rest of the parameters pertaining to school emergency drills will be undertaken, improvement towards being responsive actors in the event of disaster will improve.

Lastly, the low extent in its implementation level in disaster rehabilitation and recovery may indicate that the school community was not effectively involved in these activities. Thus they were unaware of other things to be done after a disaster. This can also be attributed to the fact that these activities entail an ample budget and that collaboration of human resource to facilitate the activities is at hand.

Table 3 reveals the different challenges and opportunities encountered in the implementation of Disaster Risk Reduction Management. Weaknesses are always part of any newly implemented program. This does not entail that the program was a failure. This only means that there is always room for improvement. The respondents in this study pointed out some challenges that somehow hinder the effective implementation of DRRM. These are as follows;

Lack of Resources Committed to the DRRM, as stated in the World Disaster Report in 2002, DRRM budget was set aside due to major conflict across the globe. The same thing in the Department of Education, a lot of programs were taken care of. In implementing a program, budget allocation is needed. Respondent 1 claimed that the school has an insufficient budget for a fire extinguisher. She further says that.

"How can we know how to use a fire extinguisher? We don't have any experience on how to manipulate it. We are just given instructions on how to use it."

With this, the respondent suggests that DRRM allocation must be included in SIP and strengthening partnership with stakeholders and agencies seem to be of great help.

Unavailability of an emergency warning system opposes the mandate of RA 9514 or The Revised Fire Code of the Philippines to have fire alarms in schools. Respondent 2 said.

"We don't know, and we are confused if that bell is for the drill, recess time, or just for the arrival or garbage collector."

With the use of a school bell only, early warning signals may not be understood. Respondent 3 added that the population staying at the back could not hear the sound; they just knew that the emergency drill was on-going since other classes already went out from their rooms. This further opposes the suggestion of UNISDR (2010) that warnings must be timely and understandable.

Limited Space to be used during evacuation assembly is one reason why children cannot correctly execute the actions and measures they have learned. This is due to the current building constructions in the school. Respondent 4 emphasized that...

"It is challenging for the children to evacuate because of the limited space, we even occupy areas which are not supposed to be stayed due to current building constructions, anyway if the installation is done, the space intended can be used."

aside. As mentioned by Respondent 6

"We don't even have an experience that LGU or an NGO will be around when we will have our hazard mapping; how much more on the actual conduct of environmental assessments."

The school has just guided with the technical assistance of a certain NGO on how to conduct environmental inspections per classroom. However, due to time constraints and a huge population, since PTA officers were also part of the crowd, the school community could not grasp all the things being taught. And that further activity and feedbacking must be done to improve and achieve the target.

With this, having the exit routes and the evacuation drill seems to be very difficult because of the large population. Twigg (2004) said that operational size influences change rate and this variable is beyond the teacher's control. However, teachers continue to look for other possibilities that will help to address the gap.

Unclear Task Designation due to the recent movement in the organization becomes another challenge in the implementation process. The turning over of roles and designation is not yet finalized; hence creating effective communication is hindered. Respondent 5 said that.

"It's unclear as to whom we will be approached; if we go to this person, we will then be recommended to go to another person. They do not know their roles."

With this scenario, the school is having a hard time cascading information previously learned, and that intervention of administrators in this area must be executed.

Lack of experience in the conduct of several disaster measures is why some vital DRR measures were not realized. Because of unawareness of the actual conduct of environmental assessments, many actions were left

Proposed Action Framework

Rationale:

Unquestionably, the objective of Disaster Risk Reduction Management is both noble and attainable. However, for DRRM implementation to fully work and achieve its purpose, all its implementation elemental requisites should be in place. The most significant of these requisites is the awareness of all the actors about the basics of DRRM that play a vital role in the program.

Table 4

Action Plan

CONCEPTS TO BE APPLIED/ SHARED	ACTIVITIES OR PROJECTS & OBJECTIVES	DATE AND DURATION (beginning & ending dates)	HUMAN RESOURCES NEEDED	FINANCIAL RESOURCES NEEDED	MATERIALS AND OTHER RESOURCES NEEDED	INDICATORS OF SUCCESS
DRR Knowledge Building School Safety Concept	Training-workshop	October 23, 2019	SEEDS Asia, SDRRM Team and the teachers	Php 3,000.00	projector manila paper, markers, meta cards	95- 100% of the teachers, PTA representatives, Student leaders will join the workshop /training
Learning PAGASA/ PHIVOLCS updates, preparedness measures	Symposium Earthquake drill	October 24, 2019	Resource Speakers From PAGASA and PHIVOLCS	Php 2,000.00	projector manila paper, markers, meta cards	95- 100% of the teachers, PTA representatives, Student leaders will join the symposium /training
Learning about fire and how to fight the fire. Applying First aid procedure	Fire Drill Drill on first aid-application	October 25, 2019	Bureau of Fire Protection CDRRMO (Mr. Kim Lauron)	Php 5,000.00	projector	95-100% of the teachers, PTA representatives, Student leaders will join the Emergency drills and first aid application

The successful DRRM implementation needs active and courageous personnel. Unfortunately, though, the teachers in Carcar Central Elementary School of Carcar City Division had so many apprehensions when the programs started. This concern is traceable to lack of appropriate training. To rectify this, the researcher formulated an Action Plan together with the Division DRRM Focal person, the school DRRM coordinator, and the whole DRRM school team. The plan was based on CDRRMO's disaster risk assessment/evaluation, which aims to supplement the knowledge and to enable them to develop lifelong skills in the DRRM implementation.

Objectives:

The action framework will secure the corrected, remediated, and ultimately, successful implementation of the Disaster Risk Reduction Management in the Carcar City Division. Focused on this goal, the program purposely outlines activities that will enrich the basic knowledge and hone the skills of the administrators, teachers, and students about DRRM as well as hone their skills in its implementation. Table 4 below presents the suggested action plan.

CONCLUSION

The school has done the necessary emergency preparedness, helping children and the rest of the community more aware of what DRR is. However, the knowledge gained by the respondents on different DRR measures is not enough. They were not highly involved in DRRM. Their insufficient awareness of different DRR measures leads to its implementation, not a successful one. The following summarizes the result: the School Community was fairly knowledgeable on the various actions and measures on Disaster risk Reduction; the school's implementation level is at a low extent only; several challenges and opportunities were encountered by the respondents in the implementation of DRRM; and an Action Framework was formulated to enhance the knowledge level and its implementation level on Disaster Risk Reduction Management.

RECOMMENDATIONS

From the evaluation of the relevant aspects in the implementation of the Disaster Risk Reduction Management of the school in Carcar, City, the researcher submits the following recommendations:

1. that the Disaster Risk Reduction Management allocation may be included in the School Improvement Plan (SIP)
2. that Carcar City Division may allocate resources for the DRR programs to be conducted to administrators, teachers, and students to involve them further and to build better awareness about DRR
3. that Carcar Central Elementary School, together with some division personnel may use the action framework formulated by the researcher which geared towards the effective implementation of DRRM. The action framework should, among others:
 - a. design assessment methods that will accurately

- evaluate the awareness of teachers and students on DRR ;
 - b. provide training to overcome issues on the lack of know-how and skills of the administrators, teachers and students, and thereby, motivate them in committing themselves in the DRRM implementation.
 - c. conceptualizes and come up with localized DRR activities in integrating DRR into lessons.
4. that teachers may be provided with training to acquire deeper awareness and new techniques in facilitating disaster preparedness measures; and
 5. that the students and the whole school community may be made aware on the implementation of the DRRM through advocacy campaign.

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Socioeconomic Status and Self-efficacy vis-a-vis Academic Performance

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ABSTRACT

The purpose of the study was to determine the effects of socioeconomic factors (SES) and the level of self-efficacy in relation to the academic performance of high school students. The study utilized a descriptive survey method using a correlational design to analyze the data collected. Prior to the study, letters were given to the division office, school head, parents, and children. Upon approval, the researcher collected necessary information through a survey, after which the data were tallied, tabulated, and statistically treated. The following were the findings of the study: most of the students' academic performance was Approaching Proficiency; most of the students were from Low-income level; the Grade 7 students manifested a Moderate level of self-efficacy; there was a significant correlation between the respondents' SES based on annual family income and their academic performance. On the contrary, the academic performance of students had no correlation with their SES based on MBN Indicators; between the students' self-efficacy and their academic performance, there was no significant relationship. In conclusion, the Grade 7 students' socioeconomic status based on annual family income was a predictor of their academic performance. However, socioeconomic status based on MBN indicators and their perceived self-efficacy were not determinant factors in their academic standing.

Keywords: socioeconomic status, self-efficacy, academic performance

INTRODUCTION

Educators treasure the power of collaborative learning, believing that two heads are better than one. As learners weave their way to the 21st Century, teachers have to be abreast of various pedagogical approaches for them to teach in these learners the skills needed in facing extensive global challenges. As the Philippines started to embrace the new K to 12 curricula, most Filipino educators face problems on implementation of the national based curriculum due to a mismatch of learning materials and the learner's individual need.

In a study conducted by Alabekee, Osaat, and Samuel (2015), collaborative learning has been proven effective in improving child and group performances. However, when it comes to the identification of low academic performance, the child becomes the focus of study, with more emphasis given to "theories of failures rather than theories of success" (Bandura, 2008). The school becomes a place where the cultivation of industrial values is more important than the development of the full potential of every child.

While collaborative strategy successfully provides feedback on team output, it does not supply individual skills (Kokemuller, 2017). The "self-limiting cost of under confidence," according to Bandura (2008), has been left unnoticed, and since efficacy is the perceived belief of the child to affect change, these activities may lead to lower confidence and insecurities to one's abilities. More so, Bandura (2008) identified mood as one factor affecting how individuals judge their efficacy as they tend to rely

on their emotional and physical states. Maslow (McLeod, 2018) claimed that deficiencies such as poor physical health, anxiety, and low self-esteem, may contribute to low self-efficacy and even decrease the success rate in life.

Schools are institutions meant to improve the quality of life for the better. They should become the catalyst for change, promote social reforms, improve the lives of the immediate community, and should not reecho the same miserable experiences of the people who come to them with hopes for improved conditions in the future. In line with these, they have to inspire learners despite failures and apply appropriate teaching strategies and interventions.

Another factor affecting educational turnouts and life outcomes are the socioeconomic conditions made available to the child. Despite the availability and presence of various studies and research, the child's socioeconomic status remains a critical social issue, a hard fact that continuously plunges the learners' lives and even exacerbates its negative impact in school and on student behavior, accomplishment, and retention.

Readiness in school shows a child's capacity to survive the social and academic environment of

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learning centers. "Unless the child is ready to participate in the learning process, the learner will not be successful" (Panneerselvam and Santhanam, 2007, cited by Barrios, 2011). It requires a physically fit, well-developed motor skills, balanced emotional quotient, and an affirmatory attitude to achieve new learning. The community and the child's abode have substantial impacts on this school preparedness. In line with readiness, the underlying motivational factors of learners, both extrinsic and intrinsic, need to be addressed from time to time to enable them to maintain enthusiasm to pursue future endeavors.

Therefore, the study wants to focus on the relationship between socioeconomic status and self-efficacy with the academic performance of Grade 7 students of Paknaan National High School and to see if having a higher self-efficacy will mirror strong academic achievement so that appropriate actions may be made to address their effects on the academic performance of respondents.

The theory used was the Self-efficacy Theory of Albert Bandura and the Theory of Human Motivation, specifically, the hierarchy of needs of Abraham Maslow to explain, understand, and answer the problems presented in the study.

By identifying the level of self-efficacy among learners, one can assess the tenacity and resiliency of these students. Since it is something understood by these people as their capability, as an expectation, once they have higher self-efficacy, they will more likely succeed, and the more they perform in school. The statement mentioned above is the Self-efficacy Theory of Albert Bandura (2008).

In the book entitled *Rejection* (1992 cited by Bandura, 2008), it reports that the noticeable feature of people who succeed in life is the unwavering sense of efficacy and a solid belief in the value of what they aim. Resilient self-efficacy supplies the needed staying power to brave out a lot of disappointment and overrule recurring rejections. While it is tough to maintain an optimistic disposition when plagued by self-doubt, it is verifiable that optimism, positive thinking about the future, and gratification with one's life are rooted in the sense of personal efficacy. If such were true, academic performance would highly reflect high self-efficacy among students despite financial challenges.

Meanwhile, the evolution of self-efficacy can be found in the interactions between the individual and their environment. The idea of efficacy offers a balance by allowing for a progressive and creative vision of the individual in defining himself or herself instead of becoming passive receivers of others' perceptions. Also, learners acquire information to assess their self-efficacy from actual executions, genuine experiences, persuasions they receive from people, and physical responses (Bandura, 1977, 2006, 2008).

As learners meet the challenges of global education, schools pave the way for mastery experiences for these younger generations. Improved technology made it easy for them to do social modeling, and since self-efficacy

can be affected by both the learner and the environment, these experiences should not be easy successes and these technologies should not become education themselves. Bandura believed that individuals with higher perceived self-efficacy have more assurance level when it comes to performing tasks despite difficulties because they understood these as challenges to be conquered instead of threats to be avoided. Such high efficacy develops intrinsic reinforcement in setting achievable goals and sustaining effort for every failure encountered. As mentioned, learners with higher efficiency realize that setbacks are reasonable, and failures are just a result of lack of preparation or insufficient knowledge capable of being controlled. On the opposite, those who have doubts about their abilities view setbacks as threats tending to shy away from failed goals, attributing deficiencies to themselves, causing poor performance and lower self-confidence in their capabilities.

Bandura claimed that the self-efficacy of individuals differs as one cannot require people to be all things, which, according to him, involves mastery of every realm of social life. Perceived belief in one's ability affects behavior and human functioning, not only directly, but also on goals and aspirations, expectations, perception of obstacles and opportunities in the environment. He also claimed that this efficacy influences people to either think positively or negatively, strategically or erratically, for it is self-efficacy that will also give them the capacity to assess the heaviness of a particular task.

In the interim, in Maslow's *A Theory of Human Motivation* (1943), he pushed forward that healthy individuals have specific needs and that these necessities are in order, with some needs being more archaic or primitive than the others. His proposed 'hierarchy of needs' is a five-level geometric triangle, with the higher needs coming into view only once, the lower requirements are achieved. The bottom four are identified as deficiency needs because once unmet, human beings become uneasy while the tip of the pyramid is considered growth need as this level means the realization of full potentials. Nevertheless, only a small number of people can self-actualize because it requires exceptional qualities such as honesty, freedom, awareness, sound judgment, creative thinking, and originality.

Maslow also pointed out that hierarchy is different for every individual, making it relative to people instead of being the same to everyone and that the hierarchy of needs was more of an unconscious goal than being a conscious choice.

The theorist also claimed that human needs to arrange themselves based on pre-potency (Maslow, 2000). That means the existence of one depends upon prior satisfaction of another, more pre-potent need, with this need not being isolated but that every need is related to the satisfaction of another obligation. Speaking of which, Maslow considers physiological need as the most pre-potent need for the absence of such need would mean that for a person who hungers for food, love, safety, and belongingness would most probably hunger for food than the rest. Dominated by his physical needs, the man pushes all other essentials to the background.

According to Green (2015), "education has been both parent and child to the developing nation-state." It becomes a tool for economic growth, and its role should be to enable the youth of today to face the challenges of globalization. While it is a fact that the flock of technology and modern communication increases the autonomy of learners, people still enter an era where "areas of relative order and safety coexist uneasily with zones of disorder and uncertainty" (Cooper, 1996 cited by Green, 2015). Hence, education should promote a change of life for the better and open up provisions for safe, comfortable living with security and respect.

Robinson (2006) believed that an institution such as school put a stigma among illiterates and focuses on the cultivation of industrial values than creativity; thus, education becomes a danger to these youths. In line with this, school becomes a breeding ground to teach the benefits of the middle class (Payne, 2013). Resulting in poor academic performance, learners are pushed to learn the benefits they cannot empathize with and where poverty forces such as low income push these individuals to focus on meeting basic needs for survival more than any achievements.

In the Philippines, the Annual Poverty Indicators Survey (APIS) of 2017 showed that nine percent of children and youths are out of schools. Out of ten Filipinos, one does not attend formal school. Living in intense and unrelenting poverty has particularly unsupportive effects (McLoyd, 1998 cited by Ferguson et al., 2007), and suffering from material adversity should not be reckoned with. Jacobs, Ir, Bigdeli, Annear, and Van Damme (2012) even claimed that in low-income countries (LIC), health care and related expenditures are a standard feature of an impoverished state.

In a report called Cebu Quickstat (2012) the Philippine Statistics Authority (PSA), claimed that the measure of the Human Development Index (HDI) is through the attainment of some Minimum Basic Need (MBN) indicators, namely, On Survival, On Security, and On Enabling. Despite being able to identify these factors, the ability to achieve humane living conditions and fullest potentials are far from reality due to lack of provisions and access to the mentioned indices.

In reality, poverty is everywhere, yet its definition becomes relative (Payne, 2013). It is often associated with individual troubles and inabilities instead of being considered a structural issue, a comparison between decent living standards or the lack of it. Mills' Sociological Imagination (1959) emphasized how society should balance structures and individual roles for failure to do so would mean continuity of poverty through time and generation. He claimed that people felt trapped in their own orbit, limited by its invisible force due to constricted interaction among family, relatives, and others in the neighborhood. They merely become observers of the outside milieu. When they realize more significant threats and ambitions, the more they understood that problems transcend locality and end up feeling more bounded by these struggles. While these people, especially the youths, do not see the minute details of interconnection

between the lines of their lives and the bigger community, who they become and their interplay very much shape their history. As such, the increased interconnection of various institutions, such as family, peers, environment, and schools, promote structural changes and the need to cultivate a sociological imagination through education, to grasp linkages to current conditions is called.

Furthermore, Mills offered a simple explanation of why poverty remains to be a social issue. He believed that people do not see the interconnection of their problems with the existing institutions surrounding them. They consider their poorness as something caused by themselves instead of being driven by the very community that catered them. With this perception, it becomes the source of an even higher cultural division among the rich and the poor, all the while reechoing transfusion of debt from one generation to the next.

On the other hand, Emile Durkheim (1993) had a different perspective. In his proposed statement on organic solidarity, he pointed out the inter-dependence of individuals. He believed that individuals were just organs of a more significant body, which is society. Thus, if poverty becomes a conflict of the organs, it affects the whole bodily functions. Durkheim believed that this is a social fact. When debt becomes a macrocosm, it should be seen as a structural issue instead of individual trouble.

How can education improve such a poor state of life? Teacher-student relationships should transcend a culture founded on the appendage of the banking system and train the youths of today to identify genuine kindness and destroy bait and switch schemes to further detriment their way of life. Freire's (2000) critical pedagogy emphasized the role of education as something that should reform towards emancipation from oppression. It implies the readiness of the child to face challenges in school and pursue success. Freire (1970, cited by Ramos, 2000) claimed that educators should not promote "multiplication of such conditions" through the prescription of actions, for these are ways of destroying creativity. Thus, education should be a training ground to yearn to be free, a constant everyday struggle towards liberation from social injustices that have been carefully planned to promote the same sad economic plight of the oppressed. With his words, he believed that real giving lies in authentic generosity so that lesser hands beg for help and more hands work to transform the world.

More so, Karl Marx (2005) believed that the history of all existing society involves class struggle. In his Communist Manifesto (1848), he pointed out that the social life of an individual is all about competition and that it is on the accumulation of power, wealth, and resources. Those who have the upper hand get more privilege than those under the social ladder, and this duplication of living conditions has passed from one generation to the next.

One famous adage of Jose Rizal talks about the youths' capacity as being the hope of the country. In William Henry Scott's statement in "Who Are You Filipino Youths?" (1990), he asserted that the youths are like children and like adults. Like adults for they are rational and critical, and like

children for, they are carefree and idealistic. He stressed the ideal character of the youth, emphasizing the crucial role of adults to be models. Since efficacy could be through social persuasion and social modeling, one cannot pour from an empty cup. Pep talks without an enabling guide attain less results, and children from low-income groups often do not acquire social skills and appropriate simulation required to prepare them for the actual world. Everyday struggles are parenting inconsistency, constant changes of primary caregivers, lack of guidance, and hapless role modeling. Most of the time, these children are deficient in parental support (Ferguson, Bovaird, and Mueller, 2007), proving the importance of addressing Maslow's deficiency needs.

In the study conducted by Mustafa, Esmā, Ertan (2012), they said that students' understanding of their capacity highly influences their behavior and optimism as an individual and that self-efficacy showed a significant correlation with students' educational performance. But they pointed out, however, that there should be more research designed to predict how self-efficacy affects academic performance.

As per Honicke and Broadbent (2015), in their 12 years of research about the relationship between self-efficacy and academic performance, the causality between self-efficacy and academic performance remains established. Their findings showed that academic self-efficacy moderately correlated with academic performance due to mediating and moderating factors such as effort regulation, deep processing strategies, and goal orientations.

Prior studies had also revealed significant and substantial direct effects of students' self-efficacy on academic expectations (Chemers, Hu, Garcia, 2001; Lent, W., She, Singley, Schmid, Schmidt, and Gloster, 2008; cited by Betoret, Rosello, and Artiga, 2017). As reported by their study findings, results showed that students with high self-efficacy have greater academic expectations and display better academic performance than students with low self-efficacy. In this finding, they have cited the relationship of expectancy-value beliefs even though expectations were not equal to self-efficacy.

The above findings of Betoret et al. (2017) suggested some implications such as first, to conduct diagnostic evaluations to detect possible shortcomings and design an action plan to improve weaknesses; second, teachers to improve students' perception of their capacity, specifically the general academic skills required to strengthen progress made at school. Accordingly, implementing actions and programs at schools is recommended to enhance students' academic skills to, in turn, improve academic self-efficacy.

Meanwhile, the study of Machebe, Ezegbe, and Onuoha (2017) pinpointed the role of family income, especially of parents, to affect the academic performance of students. Greever (2014) even stated that low socioeconomic status correlates with depressive symptoms making it hard for learners to establish social relationships.

In a study conducted by Jeynes (2002, cited by Barry, 2005), he mentioned that socioeconomic status (SES) of an individual is determined by parents' educational level, occupational status, and income level. The direct relationship between SES and academic performance shows that students who had a low SES earned lower test scores and were more likely to drop out of school (Eamon, 2005; Hochschild, 2003; cited by Barry, 2005). The finding of the study showed that in the segment as regards the family-level model, significant evidence was found for the hypothesis that students from low socioeconomic status will have lower academic attainments.

The study conducted by Islam and Khan (2017) showed a positive relationship between socioeconomic status and academic accomplishment but only at a moderately low level. The same findings of Faaz and Khan (2017) revealed the fact that there exists a high and positive relationship between socioeconomic status and academic achievement of students.

METHODOLOGY

This study utilized a descriptive survey method using correlational design to determine the effects of socioeconomic status based on the annual family income and Minimum Basic Need (MBN) indicators and the level of self-efficacy to the academic performance of Grade 7 students of Paknaan National High School for S. Y. 2018-2019.

The main instrument used in the study is divided into three sections. Part I contained the respondents' General Weighted Average for School Year 2017-2018. Part II showed the socioeconomic status in terms of annual family income and the Minimum Basic Need (MBN) Indicators provided by the Philippine Statistics Authority (NSO). The last part was the General Self-Efficacy Scale (GSE), adapted from Schwarzer and Jerusalem (1995) to assess the general sense of perceived self-efficacy of students. The third section is a 4-point scale checklist and the sum of responses to all items divided by 10 yielded the final composite score.

Barangay Paknaan is one of the 27 barangays of Mandaue City. With a land area of 174, 061 hectares (based on the report conducted by the previous 2010 NSO census), this barangay has served as an abode to various subdivisions and industrial, manufacturing firms. Ranked as one of the highest populated areas in the city, as per Census 2015 conducted by PSA, the place has a total population of 26, 943. This local unit is the only barangay secondary school, namely Paknaan National High School (PNHS). It is approximately 2.7 kilometers away from Mandaue City proper. It occupies a portion of Paknaan Elementary School (PES) and has four grade levels for the current school year. Grade 7 is equanimous to 529 learners.

Random sampling is used as a technique for respondents to have an equal chance of being selected. All sections in Grade 7 are placed inside a bottle, excluding other grade levels, and are randomly pulled out. After the respondents has been identified, a parental permit has

been given and after approval, a letter of assent have been provided to learners concerned.

RESULTS AND DISCUSSION

From Table 1, in general, the Grade 7 students' academic performance of 83.30 (SD 4.08) manifested an Approaching Proficiency, which might imply that the students at this level might have developed basic knowledge and skills and core understanding and require some guidance to perform tasks. The data supported the claim of Vygotsky (Cherry, 2019) that learned adults and knowledgeable peers are important people in scaffolding because they are very critical in the success of the learning process of children.

From Table 2, the average mean of ₱166, 308.32 (Low) might have been due to the unstable income of the people as the place had the presence of bigger industrial companies that did not cater to the needs of the immediate locality. Garg (2019) claimed that for small manufacturing companies to thrive, any major alteration in the management project must be directly connected to the very people who live in the area.

On Survival, with a mean of 2.96, the respondents were categorized as Surviving. It might have been due to the availability of electricity, water, and access to sanitary toilets but without available access to health facilities. The finding confirmed the study of Jacobs et al. (2012), which claimed that in low-income countries (LIC), health

Table 1

Academic Performance of the Grade 7 Students

Grades	Frequency (f)	Percentage (%)	Qualitative Description*	Overall Mean	Standard Deviation
90-up	16	7.02	Advanced	83.30 Approaching Proficiency	4.08
85-89	69	30.26	Proficient		
80-84	103	45.18	Approaching Proficiency		
75-79	36	15.79	Developing		
74 -below	4	1.75	Beginning		
Total	228	100			

*90-up = Advanced
85-89 = Proficient

80-84 = Approaching Proficiency
75-79 = Developing

74 and below = Beginning

Table 2

Socioeconomic Status Based on Annual Family Income

Annual Family Income*	Frequency (f)	Percentage (%)	Qualitative Description*	Mean	Standard Deviation
₱617, 000.01 up	3	1.32	High	₱166,308.32 Low	₱170,501.82
₱172, 000.01 - ₱617, 000.00	78	34.21	Middle		
₱172, 000.00 and below	147	64.47	Low		
Total	228	100			

* ₱617,000.01 up = High

₱172, 000.01 - ₱617,000.00 = Middle

₱172, 000.00 and below = Low

*Income classification was retrieved from <http://archives.pia.gov.ph/?m=12&sec=reader&rp=1&fi=p071027.htm&no=9&date=>

care and related expenditures are a standard feature of an impoverished state. The finding resonated with Abraham Maslow's theory that health is a higher need than physiological needs such as water, electricity, and sanitary toilet.

Table 3 also demonstrates that for Security indicators, the respondents have a mean of 2.58, which categorized them as Secured. It might have been due to the light and durable materials used to build the house and with the head of the family supporting all the needs of the family. This reinforced Payne's (2013) statement that poverty is relative, and its extent happens with the absence of some resources. The finding seconded Maslow's theory, which says that a person needs employment and the existence of members of the family having steady financial gains were necessary to provide a highly secured life.

On the indicator Enabling, the mean of 1.91(0.7) the students meant Barely Enabled. Few family members went to school, and some of them support their needs through working and were not able to join social groups and organizations. The result seconded the study of Greever (2014), which stated that low socioeconomic

status correlates with depressive symptoms making it hard for them to establish social relationships. The outcome reaffirmed the theory of Maslow, which claimed that the freedom to choose personal associations was the third foundation of the hierarchy of needs and to be able to answer higher demands, the first and second levels should come first.

The mean of 2.48 (0.43) in Table 3 classifies the respondents as Middle Low. The result might imply that families receive inadequate income since the environment of Paknaan has been a thriving ground for both small and big firm companies, each with a different line of specialization and unsupportive of the local industry. The finding affirmed the statement of C.W. Mills about how society should balance structures and individual roles for failure to do so would mean continuity of poverty through time and across generations. The result also highlighted Bruenig's theory (as cited by Murray, 2014) on the families' capacity to get out of structural poverty since they have the means to activate themselves economically. The outcome confirmed the theory of Abraham Maslow that survival, security, and association need to be addressed first to provide a way towards self-actualization.

Table 3

Socioeconomic Status Based on Minimum Basic Need (MBN) Indicator

MBN Indicator	Respondents (n)	Mean	Standard Deviation	Qualitative Description*
Survival		2.96	0.9	Surviving
Security	228	2.58	0.9	Secured
Enabling		1.91	0.7	Barely Enabled
Total	228	2.48	0.43	

* MBN Indicator	Survival	Security	Enabling
3.26-4.00	Highly Surviving	Highly Secured	Highly Enabled
2.51-3.25	Surviving	Secured	Enabled
1.76-2.50	Moderately Surviving	Moderately Secured	Moderately Enabled
1.00-1.75	Barely Surviving	Barely Secured	Barely Enabled
* Overall			
3.26-4.00 High	1.76-2.50 Middle Low		
2.51-3.25 Middle High	1.00-1.75 Low		

Table 4

Perceived Self-Efficacy of Grade 7 Students

Respondents (n)	Mean	Standard Deviation	Qualitative Description*
228	2.43	0.42	Moderate
*3.26-4.00 = Very High	1.76-2.50 = Moderate		
2.51-3.25 = High	1.00-1.75 = Low		

Table 4 reveals that the respondents have a mean of 2.43 (0.42), which categorized the students' perceived self-efficacy as a Moderate level. The result could mean that the respondents saw themselves with limited abilities and still had to rely on their peers, teachers, and significant others for help and guidance. The outcome supported the claim of C.W. Mills, where he stressed the ideal character of the youth; therefore, adults must be models. The same result seconded Vygotsky (Cherry, 2019) that to achieve successful learning, learners have to be supported by significant others, such as teachers and peers.

There was a significant correlation between annual family income and academic performance. Low or high

levels of academic performance correspond accordingly to high or low yearly family income. The result means that the annual family income of the respondents was a predictor of their academic performance. The outcome attributes to parental involvement, which might have affected students' academic performance. Since most parents work, there is lesser time for participation in school-related activities, engagement in extra-curricular activities, and homework monitoring.

The result supported the study conducted by Machebe et al. (2017), which laid claim that the income of the family, especially of parents, affects the academic performance of students. Abraham Maslow's hierarchy of

Table 5

Chi-Square Analysis of the Relationship Between the Respondents' SES Based on Annual Family Income Level and Their Academic Performance

Academic Performance	Annual Family Income Level			Total	Test Statistics		
	High/Middle	Low			Computed χ^2	Tabled Value	p-value
85-up	39	46		85	8.460*	5.991	0.014552*
80-84	34	69		103			
79 below	8	32		40			
Total	81	147		228			

*Significant at $\alpha = .05$ with 2df

Table 6

Chi-Square Analysis of the Relationship Between the Respondents' SES Based on Minimum Family Level and Their Academic Performance

Academic Performance	socioeconomic Status Based on Minimum Basic Need				Total	Test Statistics		
	Middle High	Middle Low	Low			Computed χ^2	Tabled Value	p-value
85-up	45	27	13		85	6.150 ^{ns}	9.448	0.188223 ^{ns}
80-84	44	46	13		103			
79 below	13	20	7		40			
Total	81	93	33		228			

^{ns} not significant at $\alpha = .05$ with 4df

Table 7

Chi-Square Analysis of the Relationship Between the Respondents' Self-efficacy and Their Academic Performance

Academic Performance	socioeconomic Status Based on Minimum Basic Need				Total	Test Statistics		
	Middle High	Middle Low	Low			Computed χ^2	Tabled Value	p-value
85-up	45	27	13		85	6.150 ^{ns}	9.448	0.188223 ^{ns}
80-84	44	46	13		103			
79 below	13	20	7		40			
Total	81	93	33		228			

^{ns} not significant at $\alpha = .05$ with 4df

needs theory, which claims that individuals find it hard to focus on achieving something higher due to unmet needs, was confirmed by the findings of this study.

The respondents' SES, in terms of MBN indicators, had no bearing on their academic performance. This finding contradicted the earlier finding, as shown in Table 5. The findings of the study also confirmed the result of Payne's study (2013), which claimed that since educational institutions operate from a common set of norms, it failed to communicate to students' in low socioeconomic status through ways in which they understand. The result supported the theory of Abraham Maslow, which cited that low-income families need to be safe, secure in a home with a stable job for the head of the family, and possess basic emotional, physical, and social needs.

Students with high efficacy may have high or low academic performance, and students who had low efficiency may have high or low academic achievement, which indicated that self-efficacy could not predict academic achievement. Since the students had an Approaching Proficiency level of accomplishment, they might not have the competence to answer the questions aptly. Consequently, they did not see the difference in the set of questions given to them. They might have needed guidance in rating the scale. This finding corroborated Mustafa, Esma, and Ertan's (2012) conclusion that there should be more researches designed to predict how self-efficacy affects academic performance. However, this failed to affirm Bandura's (2008) claim that high perceived self-efficacy produce excellent academic performance.

CONCLUSION

Based on the findings of the study, the Grade 7 students' annual family income is a predictor of their academic performance. The outcome attributes to parental involvement, which might have affected students' academic performance. Since most parents work, there is lesser time for participation in school-related activities, engagement in extra-curricular activities, and homework monitoring. Meanwhile, MBN indicators and perceived self-efficacy are not determinant factors of academic status. The finding supports that poverty is relative, and the presence or lack of it cannot determine the effects on the learners' academic performance. At the same time, the relationship between self-efficacy and academic performance still needs a lot of research to prove their correlation.

The study confirms Abraham Maslow's Hierarchy of Needs, explaining that to meet lower needs is a prerequisite before moving up to higher needs such as achievement and success. Meanwhile, Albert Bandura's Self-Efficacy theory, stating that individual self-efficacy plays a vital role in influencing and shaping life choices, is not affirmed in the study.

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ABSTRACT

Paragis is a common grass which is abundant and can be seen everywhere but is regarded as having no economic value. To add value to this grass, the study generally aimed to formulate cookies with powdered *paragis* leaves and mashed bananas; and specifically, it aimed to evaluate the sensory quality of the product. A 3 x 3 factorial design was used, with three levels for both powdered *paragis* leaves (0, 5, 10 % w/w) and mashed bananas (0, 15, 20 % w/w). Sensory evaluation was done to determine the product's acceptability in terms of color, taste, aroma, texture, and flavor using a sensory panel. Acceptability ratings were subjected to response surface regression analysis using STATISTICA software. Results revealed that the combination of powdered *paragis* leaves and mashed bananas showed a significant effect on the color, aroma, texture, taste, flavor, and general acceptability of the product. The optimum combination was 8.8 % and 1.3 to 1.8% of mashed bananas and powdered *paragis* leaves, respectively, based on the volume of flour. It can be concluded that *paragis* leaves could be utilized in cookie production, providing potential value to this unwanted commodity using the optimum combination.

Keywords: *paragis* leaves, cookie production, banana, optimization

INTRODUCTION

Paragis, also known as wiregrass, dog's tail, or goosegrass has a scientific name of *Eleusine indica* (L.) Gaertn (Garcia et al., 2003; Pizon et al., 2016; Amoah et al., 2017). This grass is abundant and can be seen everywhere, but are regarded as having no economic value. It is only utilized as carabao's food, but not until recently that the grass hit high popularity in social media, saying that it may offer health-beneficial components, and it is believed to cure illnesses potentially. According to the reports, *Paragis* indeed possesses many medicinal properties. It is believed to have a diuretic effect (Gruyal et al., 2014), antiurolithiatic effect (Amoah et al., 2017), antihelmintic activity (Morah & Otuk, 2015), antibacterial activity (Al-Zubaire et al., 2011; Mora & Otuk, 2015), antidiabetic effect (Garcia et al., 2003; Okokon et al., 2010), antifungal activity (Alaekwe et al., 2015), antiplasmodial effect (Okokon et al., 2010), antioxidant activity (Al-Zubairi et al., 2011; Iqbal & Gnanaraj, 2012), and antihypertensive activity (Tutor & Chichioco-Hernandez, 2018). It could also be used against airway inflammatory processes like influenza and pneumonia, according to De Melo et al. (2005). The hepaprotective effect (Iqbal & Gnanaraj, 2012) and pharmaceutical action of *E. indica* were reported to have been due to the generous supply of phytochemicals and antioxidants. The grass contains alkaloids, flavonoids, cardiac glycosides, tannins, and saponins (Okokon et al., 2010; Gbadamosi, 2012; Alaekwe et al., 2015; Morah & Otuk, 2015; Etta et al., 2019). Acidic compounds, anthraquinones, and terpenes were likewise observed in *E. indica* extracts (Alaekwe et al., 2015; Mora & Otuk, 2015; Okokon et al., 2010). According to Gbadamosi (2012), this botanical plant, among others,

supports increased energy and nutritional requirements in pregnancy, prevent malnutrition, and supplements phytochemicals in therapeutic activities. Moreover, safety in the administration of the weed was confirmed through toxicological studies of the plants (Gbadamosi, 2012), aside from the fact that it has been extensively used in traditional and herbal medicine applications in various countries, and possibly be included in general medical practice (Al-Zubairi et al., 2011). The potential of *paragis* in pharmaceutical and medical importance, therefore, cannot be discounted. As a commodity that is locally available and abundant here in Leyte and anywhere in the Philippines, and the neighboring countries, it calls for creating value to this disregarded grass. Hence, the development of a high-value product such as cookies that are incorporated with it.

Cookies are convenient and comfort food not only for children but for growing adults as well. One common dietary problem associated with children is the reduced or limited dietary fiber intake due to opting for foods from highly popular fast food chains. Incorporating high fiber such as *paragis* leaves into snack items may, therefore help achieve the recommended dietary fiber intake of these picky children. *Paragis* grass can contribute to about 21.57% to 29.17% of crude fiber (Garcia et al., 2003; Morah & Otuk, 2015; Suwignyo et al., 2017), to as high as

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64% as reported by Jackson et al. (1996), with digestibility coefficient of 69.6 (Regmi et al., 2004). Furthermore, macro and microminerals were reported present in paragis grass (Serra et al., 1997; Gbadamosi, 2012); among which are Co, Cu, Fe, Ca, K, Mg, Na, P. But incorporating grass in foods expectedly could impart undesirable taste and aftertaste in the product. Hence, the need to mask these undesirable traits with flavorful components. One common and effectively-known flavorant in the bakery industry is banana.

Banana is a type of fruit from herbaceous plants of the genus *Musa*. It is utilized in foods, rope, fiber, paper, placemats, hair softener, mats, medicines, and textiles production (Kumar et al., 2012). It has good nutritional value (fiber, fat, protein, ash, carbohydrate) according to Menezes et al. (2011), Odenigbo et al. (2013), and Ashokkumar et al. (2018); and are highly desirable in the diet because it imparts positive effects to human health (Singh et al., 2016). The medicinal application of banana includes antifungal and antibiotic activity, reduction of risk to high blood pressure and kidney stones, and cholesterol-lowering properties (Kumar et al., 2012). This crop is also a valuable source of vitamin B6, vitamin C, and potassium (Singh et al., 2016; Ashokkumar et al., 2018). Adeyemi and Oladiji (2009) reported that the crop could contain 0.271, 0.886, and 326.70% of Zn, Mn, and Mg, respectively. Like *paragis*, banana also contains several bioactive antioxidant compounds, namely phenolics, carotenoids, biogenic amines, and phytosterols (Singh et al., 2016). Aside from beneficial components, the leading reason banana is widely utilized in the bakery industry is its flavor. Most components in it are aliphatic esters, alcohols, and carbonyls (Tressel & Drawert, 1973), specifically iso-amyl acetate (Rao et al., 2018), which contributes widely to the desirable sensory attributes of cakes, cookies, and other pastries.

Although banana has been used extensively in cookies, the right combination of *paragis* leaves and banana is yet to be determined to attain the optimum sensory quality of the product. It is given that raw materials may contribute a significant effect on the quality of manufactured products. In cookies, the substitution of cashew-apple residue (Ebere et al., 2015), dried *moringa* leaves (Dachana et al., 2010; Abdel-Samie & Abdulla, 2014; Emelike et al., 2015; Mouminah, 2015), cladodes (Msaddak et al., 2015), and composite flour made from cassava, soybean, and mango (Chinma & Gernah, 2007) to wheat flour had a significant effect on the sensory qualities of the product. Aduana (2019) also reported that the addition of giant swamp taro flour significantly affected the color and general acceptability of the product but noted no significant effect on texture, flavor, and taste acceptability. Many of these studies established the limitation of the levels of substitution and incorporation in cookies because it was observed that these commodities had an adverse effect on the quality of the product. Hence, this study was undertaken to determine specifically the effect of *paragis* powder and banana flesh on the sensory quality of cookies.

METHODOLOGY

Procurement of Raw Materials

The *paragis* leaves were collected within the Visayas State University (VSU) grounds, while banana and the other ingredients such as all-purpose flour, eggs, sugar, baking powder, and butter were purchased at the Baybay Public Market, Baybay City, Leyte.

Preparation of Raw Materials

The *paragis* leaves were inspected and sorted. Wilted leaves were removed and trashed. The good quality leaves were washed and sanitized with ten ppm chlorinated water. Then, the leaves were placed in clean drying aluminum trays and dried at 60-70°C for 8 hrs in a mechanical dryer. Dried *paragis* leaves were allowed to cool first, then milled and powdered using pulverizer (High-speed Multi-function Comminutor).

Bananas, on the other hand, were inspected and sorted. Ripe and good quality ones were used. It was washed with clean potable water, removing all adhering soil on the skin. Then, it was blanched at 87°C for 5 minutes. The peels were carefully removed by hand, while the flesh was homogenized using an Osterizer until it became a creamy mash.

Processing of Cookies

Powdered *paragis* leaves and mashed bananas were measured and prepared according to the level specified in each treatment. The calculation was based on the weight of all-purpose flour (100 g).

Baking soda (1/4 tsp), powdered *paragis* leaves, and all-purpose flour (100g) were sifted and combined. Butter (25 g) was then creamed smoothly in another mixing bowl. Sugar (1/2 cup) was gradually added until the mixture became pale and creamy. Mashed bananas were added next. An egg was cracked and mixed onto the batter to combine. The dry ingredients were then added to the wet ingredients and were mixed (folding-in) using a spatula. A tablespoon of batter was scooped out, placed on a baking sheet, and then baked at 120°C for 30 minutes. The freshly baked product was removed from the oven and was cooled at room temperature. It was then packed in polyethylene bags ready for evaluation.

Experimental Design

A 3 x 3 factorial experiment arranged in Completely Randomized Design (CRD) was used in the study. Three combinations of powdered *paragis* leaves and mashed bananas were used with two replications (Table 1).

Table 1*Different Levels of Mashed Banana and Powdered paragis Leaves in Cookies*

TREATMENT (TRT)	PARAGIS POWDER (%)	BANANA FLESH (%)
T ₁	0	0
T ₂	0	15
T ₃	0	20
T ₄	5	0
T ₅	5	15
T ₆	5	20
T ₇	10	0
T ₈	10	15
T ₉	10	20

Sensory Evaluation

The acceptability of the product was evaluated in terms of color, aroma, taste, flavor, texture, and general acceptability using the 9-point Hedonic Rating Scale with scores of 1 to 9 corresponding to 'dislike extremely' and 'like extremely,' respectively. Descriptive scores of the samples were also determined. The samples were randomly coded with 3-digit numbers and were evaluated by 48 panelists composed of junior and senior BS Food Technology students. An Incomplete Block Design (IBD) laid out by Cochran and Cox (1957) was used in carrying out the sensory evaluation. The set plan of $t=9$, $k=6$, $r=8$, $b=12$, $E=0.94$ Type II was followed, where t refers to the number of treatments, k as the number of samples to be presented to the panelist, r the number of replications based on the plan IBD, b the number of blocks, and E the efficiency factor.

Optimization

The sensory acceptability scores were used to make contour plots of the response studied. The optimum combination of powdered paragis leaves and mashed bananas was generated considering the mean acceptability level of 7.5 for all sensory attributes. The contour plots were superimposed to get the optimum combination of the independent variables studied.

Verification

The model's predictive ability was determined using a test sample taken from the inside of the optimum region and another from the outside region. These samples were processed following the same procedure done in the experimental set-up. Sensory evaluation was done by 32 panelists composed of BS Food Technology students. Predicted values were computed based on the equation generated by the software. A paired t-test was used to determine if there was a significant difference between the actual and predicted values.

Statistical Analysis

Results of the sensory evaluation were subjected to Response Surface Regression Analysis using STATISTICA

software to determine the effects of independent variables on the sensory attributes of the product. Response surface plots were made in all parameters evaluated to visualize the different effects of the factor variables on the responses studied. Analysis of variance and parameter estimates were done to describe the regression models of each attribute. Plots were superimposed, and optimum conditions were determined.

RESULTS AND DISCUSSION

Effect on Color

Color is vital to attract consumers before they consume the product (Francis, 1991). In this study, the cookies' color ranges from 'light brown to dark green' (Table 2). In the absence of powdered paragis leaves and mashed bananas, the cookies' color was perceived as 'light brown.' Table 2 shows that increasing the amount of powdered paragis leaves to 10 % and 20% for mashed bananas, the product's color intensified and was described as 'dark green'. This is due to the chlorophyll content of paragis leaves (Chen et al., 2014).

Table 3 displays the overall mean color acceptability of the cookies, 7.323 that falls under the 'like moderately' category in the 9- Point Hedonic Scale. Response Surface Regression Analysis shows that the color acceptability of the cookies was significantly affected by the linear terms of powdered paragis leaves (Table 4). It reveals that a unit increase in the level of powdered paragis leaves results in a decrease in color acceptability by 0.894. Figure 1(a) illustrates that high acceptability ratings are oriented towards low levels of powdered paragis leaves. A similar trend was recorded by Aduana (2019), Dachana et al. (2010), and Ebere, et al. (2015), in cookies made from giant swamp taro powder, cladodes powder, and powdered cashew-apple fiber, respectively. Researchers like Abdel-Samie and Abdulla (2014), Emelike et al. (2015) and Msaddak et al. (2015), also observed the same in cookies added with moringa powder. Not only in cookies, El-Gammal et al. (2016) observed that crust and crumb color scores of pan bread decreased with increasing moringa leaves powder. According to Gustafson (2016), the color of baked products depends greatly on the ingredient used. Changes in the color are brought about by varying composition of raw

materials that is mostly agricultural commodities. These commodities possess enzymes and components such as flavonoids and phenolics, which may affect desirable and undesirable changes in the product's color (Ho, 2014).

Effect on Aroma

The aroma is considered the most important of the three components of flavor (taste, smell and trigeminal effects) (Fioni, 2008). This parameter is aided by means of

Table 2

Summary of the Sensory Quality Descriptions of Cookies as Affected by the Different Levels of Powdered paragis Leaves and Mashed Banana Flesh

TRT	VARIABLES		SENSORY ATTRIBUTES				
	X ₁ (%)	X ₂ (%)	COLOR	AROMA	TEXTURE	FLAVOR	TASTE
1	0	0	Light brown	Absence of aroma	Crumbly	Strongly aroma butter	Just right
2	0	15	Brownish white	Slightly perceptible banana	Soft	Strongly perceptible banana flavor	Just right
3	0	20	Brownish white	Slightly perceptible banana	Soft	Strongly perceptible banana flavor	Sweet
4	5	0	Light green	Slightly perceptible to moderately perceptible <i>paragis</i>	Crumbly	Slightly to moderately perceptible <i>paragis</i> flavor	Slight bitter
5	5	15	Creamy green to light green	Well blended <i>paragis</i> and banana	Soft	Slightly to moderately perceptible <i>paragis</i> flavor	Just right
6	5	20	Creamy green to light green	Slightly perceptible to moderately perceptible <i>paragis</i>	Soft	Well blended <i>paragis</i> and banana flavor	Just right
7	10	0	Dark green	Slightly perceptible to moderately perceptible <i>paragis</i>	Soft	Moderately perceptible <i>paragis</i> flavor	Slightly bitter
8	10	15	Dark green	Slightly perceptible to moderately perceptible <i>paragis</i>	Very Soft	Slightly perceptible <i>paragis</i> flavor	Just right
9	10	20	Dark green	Well blended <i>paragis</i> and banana	Soft	Well blended <i>paragis</i> and banana flavor	Just right

TRT – treatment; X₁- powdered paragis leaves; X₂ – mashed banana

Table 3

Summary of Mean Sensory Acceptability Scores for paragis Cookies

TRT	VARIABLES		SENSORY ATTRIBUTES					
	X1 (%)	X2 (%)	COLOR	AROMA	TEXTURE	FLAVOR	TASTE	GENERAL ACCEPTABILITY
1	0	0	7.936	7.625	7.672	7.688	8.172	7.984
2	0	15	7.906	7.787	7.344	7.719	8.125	7.953
3	0	20	7.578	7.313	7.047	7.484	7.703	7.686
4	5	0	7.266	7.125	7.436	7.234	7.203	7.313
5	5	15	7.109	7.125	7.125	7.063	7.203	7.344
6	5	20	7.344	7.547	7.219	7.375	7.640	7.516
7	10	0	7.047	7.219	6.984	7.094	7.063	7.047
8	10	15	6.831	7.000	7.200	7.062	7.369	7.185
9	10	20	6.889	7.238	6.984	7.365	7.429	7.286
Over-all response mean			7.323	7.330	7.224	7.342	7.545	7.479

TRT-treatment; X1-powdered paragis leaves; X2- mashed banana n= 64; Values with the same letters are not significantly different from each other

9-point Hedonic range of score:

9- like extremely 7- like moderately 5- neither like nor dislike 3- dislike moderately 1- dislike extremely
 8- like very much 6- like slightly 4- dislike slightly 2- dislike very much

Table 4

Summary of Parametric Estimates for the Acceptability of all Sensory Attributes of the Cookies

PARAMETER	PARAMETRIC ESTIMATE					
	COLOR	AROMA	TEXTURE	FLAVOR	TASTE	GENERAL ACCEPTABILITY
Mean/Interc.	7.335*	7.326*	7.247*	7.337*	7.536*	7.475*
(1) Paragis (L)	-0.894*	-0.433*	-0.351*	-0.486*	-0.776*	-0.741*
Paragis (Q)	-0.125	-0.097	0.055	-0.178	-0.295*	-0.133
(2) Banana (L)	-0.146	0.043	-0.280*	0.069	0.112	0.048
Banana (Q)	-0.025	-0.053	0.070	-0.110	0.003	0.009
1L by 2L	0.049	0.069	0.325*	0.172	0.376*	0.231
R-squared	0.108	0.027	0.027	0.039	0.085	0.084

* - significant at p < 0.05

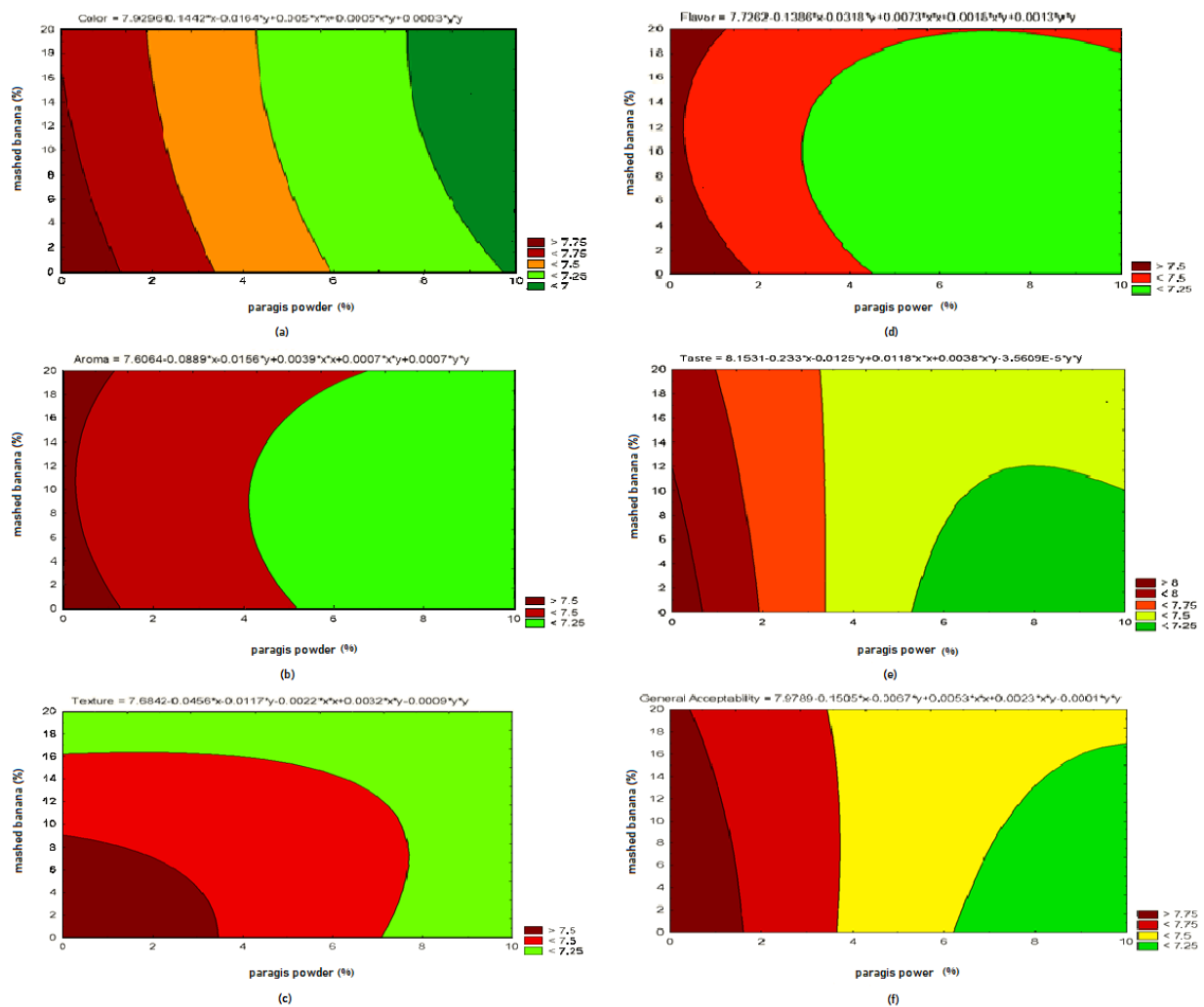


Figure 1. Response surface plots of the interaction of powdered paragis leaves and mashed banana, and their influence on the acceptability for (a) color, (b) aroma, (c) texture, (d) flavor, (e) taste, and (f) general acceptability

the human sense of smell.

In this study, the mean acceptability scores for aroma ranges from 7.000 to 7.781 which falls under the 'like moderately' category in the 9-point Hedonic rating scale (Table 3). The panelists scored highest on cookies with 15 % mashed banana (no powdered *paragis* leaves). Generally, high levels of powdered *paragis* leaves with high levels of mashed bananas caused the ratings to decrease (Table 3). Response Surface Regression Analysis of *paragis* cookies shows that there is a significant evident correlation in linear terms that exist between aroma acceptability and the different levels of powdered *paragis* leaves (Table 4). The response for aroma revealed that a unit increase in powdered *paragis* leaves significantly cause a decrease in acceptability by 0.433 in the forenamed parameter (Table 4). Also, El-Gammal et al. (2016) and Sengev et al. (2013) agree with this finding.

Moreover, the sensory panel initially perceived the aroma of banana in the absence of *paragis* leaves. The incorporation of *paragis* leaves led to perceiving the leaf's odor than the banana, even at a 15% level of the latter (*paragis* powder is 5%). Only at the highest level of mashed bananas that blend of *paragis* and banana aroma was perceived (Table 3). The powdered *paragis* leaves dominate the aroma of the cookies. This implies that volatile compounds possessed by powdered *paragis* leaves may have dominated the mixture of aromatics and could have overpowered the complex aroma of banana. Sengev et al. (2013) attributed the decrease of sensory score to the herbal flavor imparted by moringa leaf powder in bread. A similar reason could have happened in *paragis* cookies.

Effect on Texture

Table 2 generally describes the texture of the product. The product without *paragis* powder and mashed bananas was crumbly. Incorporating mashed bananas in the formulation basically softens the product because the latter has high moisture content. On the other hand, in the absence of mashed bananas with a low level of *paragis* powder (5%), the texture was described similarly to the control (crumbly). However, as the level of *paragis* powder increases to 10% (no mashed banana), the product became soft. This finding is in disagreement with the report of Dachana et al. (2010). They reported that powdered *moringa* leaves in cookies diluted the gluten and produces hard dough having less cohesiveness, adhesiveness, gumminess and springiness, which resulted in a very hard cookie product.

In terms of texture acceptability, the control had the highest mean acceptability rating of 7.67 (like moderately), which means that the incorporation of either powdered *paragis* leaves and mashed bananas would lower the acceptability rating for texture. The softness of the cookies could have caused a low acceptability rating on the forenamed parameter. Moreover, regression analysis was statistically evaluated in having a high significance in its linear, quadratic, and cross-product terms (Table 4). The linear effect of powdered *paragis* leaves and mashed bananas caused a negative effect on texture acceptability, but a consequent positive 0.325 units are anticipated for

every unit change in the interaction of both factor variables (Table 4). Figure 1(c) illustrates that low acceptability was oriented towards high levels of both *paragis* powder and mashed bananas. This result was in agreement with Chima and Gernah (2007), Dachana et al. (2010), Barine (2015), Emelike et al. (2015), Mouminah (2015), Msaddak et al. (2015), and El-Gammal et al. (2016) who reported that there was a significant decrease in the liking scores on the texture of baked products added with various types of non-conventional baking ingredients. Hafez (2012) and Aduana (2019) reported otherwise. Majoram powder in a cake (Hafez, 2012) and giant swamp taro powder in cookies (Aduana, 2019) did not significantly affect the preference of the sensory panelists towards texture.

Effect on Flavor

The flavor is a perception of stimulating a combination of the taste, smell, and trigeminal effects (Figoni, 2008). The forenamed author also reported that flavor perception depends on many factors related to the product being evaluated and the person doing the evaluation.

In this study, the sensory panels described the control as having a 'strong buttery' flavor (Table 2), while both powdered *paragis* leaves and mashed bananas dominate the flavor of the product (Table 2) once incorporated into it. It was noted that the overall mean acceptability of the product is 7.34 (Table 3), which corresponds to the 'like moderately' category in the 9-point Hedonic rating scale. The regression analysis unveils that flavor acceptability is dictated by powdered *paragis* leaves (Table 4). Parameter estimates reveal that a unit increase in the level of powdered *paragis* leaves is estimated to reduce the response by 0.486 significantly. Figure 1(d) illustrates that flavor acceptability decreases when powdered *paragis* leaves and mashed bananas increase. A similar trend was observed in cookies (Dachana, 2010; Abdel-Samie & Abdulla, 2014) and bread (Sengev et al., 2013) incorporated with *moringa* powder.

Effect on Taste

The panelists generally perceived the cookies without powdered *paragis* leaves as 'sweet,' while cookies in the absence of mashed bananas (in the presence of powdered *paragis* leaves) are generally perceived as 'slightly bitter' (Table 2). Both treatment samples have taste acceptability corresponding to 'like moderately' of the 9-point Hedonic rating scale. The control, on the other hand, was scored 8.172, which falls under the 'like very much' category (Table 3). The Response Surface Regression Analysis estimated that a unit increase in powdered *paragis* leaves might cause a significant decrease in taste acceptability by 0.776; likewise, the square unit increase of such is estimated to decrease the response by 0.295 as well. Figure 1(e) illustrates the orientation of the surface, as described above. This result is similar to the reports of various authors, namely Chinma and Gernah (2007), Hafez Abdel-Samie, and Abdulla (2014), Emelike et al. (2015), Mouminah (2015), and El-Gammal et al. (2016). They observed that (2012), the addition of mango flour and powdered *moringa* leaves significantly decreased

the preference of sensory panels to cookies and bread at increased levels of the forenamed ingredients. Studies on the addition of 20% powdered cashew-apple fiber and giant swamp taro flour are in disagreement with this finding (Ebere, 2015; Aduana, 2019). It was reported that the addition of the forenamed ingredients in cookies did not cause a significant effect on the taste acceptability of the product. Msaddak et al. (2015) also reported slight likeness in cookies with high cladodes powder supplementation on the product. On the other hand, the interaction of both powdered *paragis* leaves and mashed bananas may contrarily result in a 0.376 increase in the response for taste acceptability, which may be due to masking of mashed bananas on the undesirable taste imparted by powdered *paragis* leaves.

Effect of General Acceptability

General acceptability is synonymously termed as over-all acceptability. The control and cookies with mashed bananas (without powdered *paragis* leaves) are generally having high acceptability ratings than cookies containing powdered *paragis* leaves. The Regression

coefficients for over-all acceptability, on the other hand, showed a significant difference at $p < 0.001$ as affected by linear terms of powdered *paragis* leaves (Table 4). This suggests that powdered *paragis* leaves have a major role in the decrease of the general acceptability of the product (0.741 reductions per unit increase of powdered *paragis* leaves). This was clearly illustrated in Figure 1(f), which shows that high general acceptability is oriented towards low levels of powdered *paragis* leaves. A similar trend was observed by Dachana et al. (2010), Emelike et al. (2015), Mouminah (2015) and Abdel-Samie and Abdulla (2016) in cookies added with moringa powder; El-Gammal et al. (2016) and Sengev et al. (2013) in bread with powdered *moringa* leaves; and in cookies with plantain flour and Bambara groundnut protein concentrate (Barine, 2015). Contrarily, Hafez (2012), Ebere et al. (2015), Msaddak et al. (2015), and Aduana (2019) reported that added majoram in cake, cashew-apple residue in cookies, cladodes powder in cookies, and giant swamp taro powder in cookies do not significantly affect the overall acceptability of these products.

Although this study reports a significant decrease

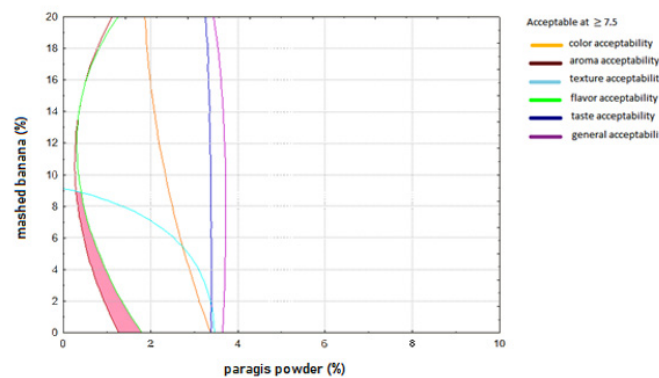


Figure 2. Superimposed contour plots of sensory attributes of *paragis* cookies at ≥ 7.5 acceptance rate in 9-point Hedonic rating scale

Table 5
Verification test results of the observed and predictive capacity of the model

PARAMETER	TRT	MEAN	SD	SE	t-value	DF	p
Color Acceptability	T1	8.07	0.740	0.135	0.123	29	0.903 ^{ns}
Aroma Acceptability	T1	7.93	0.858	0.157	0.532	29	0.599 ^{ns}
Texture Acceptability	T1	7.71	0.876	0.160	-2.082	29	0.046*
Flavor Acceptability	T1	7.87	0.583	0.106	-1.409	29	0.170 ^{ns}
Taste Acceptability	T1	7.63	0.714	0.130	-0.894	29	0.378 ^{ns}
General Acceptability	T1	7.93	0.583	0.106	-2.034	29	0.051 ^{ns}
	T2	7.8					
	T2	7.33					
	T2	8.31					
	T2	6.5					
	T2	6.67					
	T2	6.6					

T1 inside the optimum region (1.8% powdered *paragis* leaves, 8% mashed banana)

T2 – outside optimum region (5% powdered *paragis* leaves, 15% mashed banana)

^{ns}-no significant difference at $p > 0.05$; *-significant at $p \leq 0.05$

in acceptability in all sensory parameters, it is good to note that the overall mean acceptability of the cookies is 7.479 (Table 3), which corresponds to the "like moderately" category of the 9-Point Hedonic Rating Scale. This indicates that the product still has a fair chance of penetrating the market because of its high acceptability rating.

Optimum Formulation of Cookies

Figure 2 presents the superimposed contour plots of the different sensory attributes. The parameters, namely color, flavor, and aroma are the limiting factors of the product. The optimum combination of the two variables is 8.8 % for mashed bananas and approximately 1.3 to 1.8 % for powdered *paragis* leaves.

Verification

The model's predictive ability was determined using a test sample taken from the inside of the optimum region and other from the outside region. Table 5 shows a summary of the test between the predicted value versus the observed value of the product. The results show that the observed value of the treatment inside the region regarding of color, aroma, flavor, taste, and general acceptability was not significantly different from the predicted and actual values.

CONCLUSION

Paragis leaves could be exploited by cookie manufacturing industries as a potential source of beneficial components. The levels of powdered *paragis* leaves significantly affected the color, taste, aroma, texture, and general acceptability of the product. The recommended level for use is approximately 1.3 to 1.8 %, combined with 8.8% of mashed banana.

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Graduate Theses' Rhetorical Moves in the Introduction and Methodology Sections

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ABSTRACT

This study aimed to analyze the rhetorical moves found in the introduction and methodology sections of the Master of Arts in Applied Linguistics' (MAAL) Theses of the Department of Communications, Linguistics, and Literature (DCLL). Swales' (1990) CARS Model of Rhetorical Moves and the corresponding model of the method section by Lim (2006) served as the frameworks. All graduate theses, a total of 22, of the MAAL program from 2005 to 2018 served as data. The theses copies were retrieved from the library or from the authors. Findings revealed that discourse analysis, pragmatics, conversation analysis together with second language acquisition & bilingualism especially code-switching have been mostly explored while Labov's (1999; 1967) framework in analyzing narrative structure was considered overused. Swales' (1990) three 'moves' in writing an introduction were employed following this pattern: Establishing a territory (Move 1) by Claiming Centrality (Step 1A under Move 1) followed by Establishing a niche (Move 2) by indicating a gap (Step 1B under Move 2), and Occupying niche (Move 3) by outlining purposes (Step 1A under Move 3) as the most prevalent pattern. On the other hand, in terms of moves in the methodology section, this pattern is applied: Describing Data collection procedures (Move 1) by describing the location (Step 1A), population size (Step 1B), and recounting the steps in data collection (Step 2) followed by Delineating procedure/s for measuring variables (Move 2) by presenting an overview of the design (Step 1), and Elucidating data analysis procedure/s (Move 3) by relating data analysis procedure/s (Step 1). Findings suggest that the research design (i.e. qualitative and quantitative), environment, participants/respondents, instruments, and procedures are highly important in describing the methodology of the study. Significant implications for research writing are also discussed.

Keywords: Applied Linguistics, Graduate Theses, Rhetorical Analysis

INTRODUCTION

Swales (1990 in Martin 2013) defined genre as "a class of communicative events with some shared set of communicative purpose." These purposes are recognized by members of the professional or academic community in which the genre occurs, and thereby constitute the rationale for the genre (<https://ses.library.usyd.edu.au/bitstream/2123/1701/4/04chapter3.pdf>). He added that as each follow a distinctive communicative goal, the structure of research articles, presentations, and proposals differ from one another. Further, Bhatia (1993) indicated that genre analysis helps in the functional explanation of specific genres. In this sense, genre analysis approach can help illuminate not only how genres are written but also why they are written the way they are.

The genre-based approach is often used by many to understand research articles. Swales (1990 in Maswana et al., 2015) proposed and developed the concept of a move, a structural segment that has a specific communicative function and purpose to analyze textual structure. According to Bhatia (1993), a move has a characteristic

specific to a genre, thus knowledge about the function of each move and the structural pattern of the text will allow for a greater understanding of a specific genre.

Much work has been done applying move analysis (e.g. Ding, 2007; Maswana et al., 2015; Peacock, 2011; Fazilatfar & Naseri, 2014). Some researchers have conducted move analysis across disciplines: Puebla (n.d.) focused on the different moves found in Psychology research articles; Maswana et al. (2015) analyzed the research articles across five engineering fields; Martin (2013) investigated the teaching of academic writing using move analysis and a functional genre-based approach; and Brett (1994) examined research articles from the discipline of sociology. However, studies that applied move analysis in the field of Applied Linguistics are much fewer (e.g. Lores, 2004 in Dara-bad 2016; Amnuai & Wannaruk, 2013; Fazilatfar & Naseri, 2016), and

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tend to focus on the research abstracts, discussion section and/or the entirety of linguistic article. The present study thus attempted to make a contribution to knowledge by examining Applied Linguistic researches focusing on their rhetorical structures commonly used in the Introduction and Methods sections.

Before the inception of the Master of Arts in Applied Linguistics Program, there were already studies related to linguistics evident in the Master of Arts in English Language Teaching which was offered by the Department of Languages and Literature, now named Department of Communications, Linguistics and Literature. However, as the Master of Arts in English Language Teaching was replaced with the Master of Arts in Applied Linguistics program, the interests of graduate students were on discourse and pragmatics (e.g. Alcisto, 2005 & Gonzales, 2005) that pioneered the said program. Then, the other new researchers explored the Cebuano language (Enricuso, 2016), teacher talk and commentaries (Maghanoy, 2018 & Unabia, 2017), Philippine languages (Tubac, 2013) and genre analysis (Barabas, 2017). Most of the theses writers chose discourse and pragmatics (e.g. Malimas, 2010; Opina, 2014; Cacha, 2013, Constantino, 2013, Villaruel, 2014, etc.) aside from second language acquisition (Magno, 2011) and phonology and phonetics (e.g. Bedio, 2014 & Cuizon, 2013). Consequently, this observation prompted the present study to help future researchers apply new research approaches, aside from the repetitive existing MAAL researches, and explore more relevant and timely issues that will respond to the needs of the community.

Hence, there is a need to fill the research gap through analyzing the introduction and methodology including the designs and theories of these master's theses to provide opportunities for graduate students as well as undergraduate students to explore new topics, theories, and research designs.

Review of Related Literature

The following subsection is the review of the related studies on these move analysis.

Moves in the Introduction Section

Fazilatfar and Naseri (2014) investigated the move analysis of research articles in applied linguistics Iranian journals and negotiation of researchers' identities. Pho's (2008) model of move analysis and Hyland's (2002) framework of writer identity were applied in analyzing 30 published research-based articles randomly selected from four journals of Applied Linguistics. The overall organizational structure of the articles were looked into, that is, Pho's 19 rhetorical moves (i.e. four in Abstract, three in Introduction section, four in the Method, four in Result section and four in Discussion section) as well as Hyland's (2002) first person functional taxonomy. Findings revealed that the 3 moves in introduction section occurred frequently with minimal variation in the order such as the occurrence of presenting the present work immediately after the first move, establishing a territory. An additional move such as drawing implication was also found. With the same intent, the present study intended to analyze the

rhetorical moves of MAAL theses and looks into distinct rhetorical features applied in this discipline.

Second, Fazilatfara and Naseri (2014) examined the relationship between generic organizations of research articles in applied linguistics Iranian journals as well as the identities of researchers. This study used Pho's (2008b in Fazilatfara & Naseri, 2014) model of move analysis in analyzing the thirty published research-based articles were selected randomly selected from the four journals. Pho (2008b in Fazilatfara & Naseri, 2014) identified the four moves in the methods section. These moves are the following: move 1, describing data collection procedure"; move 2, describing how the data is analyzed; and move 3, describing the overall design of the study. The findings showed different percentages of writer identity categories across different moves of articles. However, this study used another model in analyzing both the introduction and methods sections of the applied Linguistic articles. Third, Peacock's (2011) study analyzed a corpus-based analysis of the communicative move structure of 288 research article methods sections across eight disciplines, namely, physics, biology, chemistry, environmental science, business, language and linguistics, law, and public and social administration. The findings showed the evidence of these three moves such as materials, procedure, and data analysis.

Salom, Monreal and Olivares (2008) conducted a study on the move-step structure of the introductory sections of 21 Spanish PhD Theses based on a modified version of Bunton's (2002) revised CARS model for English PhD theses introduction. He added new steps to Swales' model to clearly express the research perspective, the purpose of their work, the positioning and organization of their texts such as defining terms, indicating a problem or need, method, materials or subjects, product of research/model proposed, justification/significance and thesis structure. Introduction chapters were collected from an online library of *Proquest Information and Learning* and identification of predominant lexico-grammatical features, each text segment was examined individually and coded according to its communicative function. This individual coding was then peer-reviewed. Results showed that although Bunton's (2002) steps many moves are unaccounted; hence, the researchers proposed their own model according to the context and organization of Spanish graduate students' introduction of their PhD Theses. Unlike Salom et al.'s (2008) study, the present study examined 22 MAAL theses from the university's library.

Another study was done by Badib and Sutopo (2017) who collected 20 journal articles from science journals written by Indonesian lecturers of five state universities. Swales' move analysis, was employed in finding out non-native speakers' conformity to the principles of writing introduction in a research article. Findings indicated that the English research articles' introduction section written by non-native speakers did not meet the criteria or principles suggested by experts representing Anglophone's scientific work. Further, rhetorical functions vary especially in non-IMRD (Introduction-Method-Results-Discussion) papers. Results also show that non-IMRD papers contain incomplete moves while IMRD papers

contain complete moves. Although the present study used Swales' model, the present study focused on introduction and methodology sections.

Moves in Methods Section

There have been studies that explored and analyzed the rhetorical moves of the method section of the research papers such as Cotos and Link (2017), Fazilatfara and Naseri (2014), and Peacock (2011). In the first study, Cotos and Link (2017) looked into the rhetorical structures of the huge multi-disciplinary corpus of the research article methods sections by using a top-down analysis of a corpus of nine hundred texts which represented the thirty academic fields. The data that were gathered consisted of a specialized corpus of nine hundred research articles from thirty disciplines through compiling the corpus with the collaboration with active researchers & strong publication records and consultants of the field.

Then, the Demonstrating Rigour and Credibility (DRaC) model was used as a framework in analyzing the data. Results revealed that the methods section of research articles contained three moves (i.e. move 1, contextualizing study methods; move 2, describing the study; establishing credibility) and the corresponding sixteen steps. In addition, this study is similar to the present study since it also focused on the methods section and the same model was used in the analysis but the data of the present study consisted of the master's theses of the single discipline only, that is, Applied Linguistics. To sum up, these empirical studies are very helpful to the present study in figuring out similarities and differences of these moves to the moves applied by the graduate students in the Applied Linguistics program of the University of San Carlos.

On the contrary, most of the reviewed studies were done abroad and there was no study that analyzed both the introduction and methodology sections. Hence, there is a need to fill the research gap through analyzing the introduction and methodology including the designs and theories of these master's theses to provide opportunities

for graduate students as well as undergraduate students to explore new topics, theories, and research designs. This study will also strengthen the awareness of the graduates on the rhetorical moves in writing theses.

Statement of the Problem

This study aimed to determine and analyze the rhetorical moves found in the introduction and methodology sections of Master of Arts in Applied Linguistics' (MAAL) Theses from 2005 to 2017. Particularly, this study sought to answer the following questions

1. What style is employed in MAAL graduate theses from 2005 – 2017 in terms of:
 - 1.1 Discipline
 - 1.2 Theoretical Framework
 - 1.3 Research Design
2. What rhetorical moves as proposed by Swales (1990) CARS' model are present in the introduction sections of these graduate theses?
3. What rhetorical moves as proposed by Lim (2006) are evident in the method sections of these graduate theses?

Theoretical Framework

Swales' (1990) Model of Rhetorical Moves i.e. Create a Research Space Model (CARS) and the corresponding model of the method section by Lim (2006) serve as the frameworks for the current study.

Swales (1990) CARS' model

The notion of communicative purpose is central to Swales' (1990) move analysis. Swales (1990 in Moyano, 2009) stated members of a discourse community share genres that achieve their own communicative purpose. In the writing of research articles (RA), researchers follow specific organizational patterns in writing RAs. One of the genre-based approaches in identifying the structure of

Table A
Swales (1990 in Musa and Khamis, 2015) CARS Model

Move 1	Establishing a Territory
	Step 1 : Claiming centrality
	Step 2 : Making topic generalization
	Step 3 : Reviewing items of previous research
Move 2	Establishing Niche
	Step 1A : Counter Claiming
	Step 1B : Indicating a Gap
	Step 1C : Question-Raising
	Step 1D : Continuing Tradition
Move 3	Occupying Niche
	Step 1A : Outlining purposes
	Step 1B : Announcing present research
	Step 2 : Announcing principle findings
	Step 3 : Indicating RA Structure

research articles is *Move Analysis*.

Swales (1990) proposed a framework for the move analysis known as CARS (Create a Research Space) based on research conducted on research article introductions in physics, medicine and social sciences. The first version of the model (Swales, 1981) comprised of four moves and was based on an analysis of short RA introductions. Later, he modified his analytical model to adequately capture the rhetorical movement in introductory sections of research articles from different contexts. The CARS model proposes a move structure for research article introductions. The revised CARS model (Swales, 1990) comprises 3 Moves: (1) Establishing a territory, (2) Establishing a niche, and (3) Occupying the niche. Each of the moves proposed consists of steps or sub-moves within it.

Move 1: Establishing a Territory

In this move, the author sets the context for his or her research, providing necessary background on the topic. The researcher establishes the field of study by claiming the research topic in terms of specific areas of the study, the importance of the topic, and providing the background of it. Related research is also reviewed to provide readers the main points of the literature (Tongsibsong, 2012). This move includes one or more of the following steps:

Step 1: Claiming Centrality

The author asks the discourse community (intended audience) to accept that the research about to be reported is part of a lively, significant, or well established research area.

Step 2: Making Topic Generalizations

The author makes statements about current knowledge, practices, or phenomena in the field.

Step 3: Reviewing Previous Items of Research

The author relates what has been found on the topic and who found it. In citing the research of others, the author may use integral or non-integral citation.

In Move 1 "Establishing a territory", the writer points out the relevance of his/ her research to issues and propositions agreed upon by the academic community to contribute to the understanding of the pertinent issues that are of interest to that of the academic circle.

Move 2: Establishing a Niche

In this part, the author argues that there is an open "niche" in the existing research, a space that needs to be filled through additional research. The author can establish a niche in one of four ways:

Counter-claiming

The author refutes or challenges earlier research by making a counter-claim.

Indicating a Gap

The author demonstrates that earlier research does not sufficiently address all existing questions or problems.

Question-raising

The author asks questions about previous research, suggesting that additional research needs to be done

Continuing a Tradition

The author presents the research as a useful extension of existing research.

In Move 2 "Establishing a Niche" the writer/ researcher challenges the claim and findings of previous researches. The author highlights the shortcomings, gaps and unanswered questions regarding the established territory and consequently to emphasize the necessity for further and more profound investigations (Habibi 2008).

Move 3: Occupying a Niche

The author turns the niche established in Move 2 into the research space that he or she will fill; that is, the author demonstrates how he or she will substantiate the counter-claim made, fill the gap identified, answer the question(s) asked, or continue the research tradition. The initial step (1A or 1B) is obligatory,

Step 1A: Outlining Purposes

The author indicates the main purpose(s) of the current article.

Step 1B: Announcing Present Research

The author describes the research in the current article.

Step 2: Announcing Principal Findings

The author presents the main conclusions of his or her research.

Step 3: Indicating the Structure of the Research Article

The author previews the organization of the article.

In Move 3, the writer reveals his/her solution to help fill the gap, answer the specific question or continue a research tradition that has been presented in Move 2. The Move Analysis model put forward by Swales (1981, 1990) is an example of such a specific genre-level analysis to analyze the discourse structure of texts from a specific genre; the text is described as a sequence of 'moves', where each move represents a stretch of text serving a particular communicative function (Upton & Cohen, 2009).

Rhetorical Moves in the Method Section

The Method Section in research articles plays a vital role in providing the readers information on the aspect of reliability, validity, and a description of research steps taken. The Method section comprises the specific research procedure, material and analysis. Without the Method section in an RA, the author might not be able to convince the readers on how the findings were obtained and the validity of the research itself. Lim's (2006) comprehensive model for analyzing Methods section in research articles was employed as the analytical framework for the study.

Move 1: Describing Data collection procedures

In this section of the research method, subheading are used to signal the beginning of Move 1 which includes "Sample", "Subjects", "Data Sources", "Selecting Participants

and Collecting Data", "Setting, Subjects and Procedures", and " Research Site". The description of data collection procedure involves specification of the characteristics of a sample while the procedures involved in collecting may be mentioned as a series of steps or actions which are often justified.

Step 1: Describing the sample

This step includes statements on: (1) the location or source of the sample, (2) the size of the population, (3) the characteristics of the sample and (4) sampling techniques or criteria.

Step 2: Recounting steps in data collection

This step includes procedural verbs denoting steps taken in collecting data were used to recount sampling activities.

The data collection process consists of a series of steps, which are successive actions expressed in the past simple tense even though some actions also occurred simultaneously. In recounting steps in data collection, time-relationship adjuncts may be in the form of adverbs denoting temporal sequence or prepositional phrases indicating temporal relationships. They are generally used as transitional expressions introducing steps taken at different stages of a data collection process.

Step 3: Justifying the data collection procedures.

Step 3 exists only if Move 1-Step 3 does. It enables the presumed readership to understand the characteristics and acceptability of the procedures concerned. Writers justify the data collection procedures by: (1) highlighting the advantage/s of using the sample in comparison to other samples used in previous studies, and (2) indicating the extent to which the sample is representative of the population.

In signaling justifications, words with positive connotations that highlight the size and representativeness of the sample are used. In terms of negative connotation, mechanisms of negation can be used to provide a positive description of the sampling technique. A negative expression may be negated by a negative determiner "no", a negative adverb "not", or a negative adjective, thus forming expressions with positive connotation that justify the sampling technique. In this part, writers also make reference to previous research methods in an attempt to demonstrate justifiability of the data collection.

Move 2: Delineating procedure/s for measuring variables

This includes explanation on how measurements of dependent and independent variables could be made. Sub-headings that are generally used to signal the beginning of Move 2 include "Research Design", "Measures", and "Measurements of the Independent Variables".

Step 1: Presenting an overview of the design

The writer begins with a general statement of the type of design which is usually described in terms of the types of independent variables included in the designs.

Step 2: Explaining method/s of measuring variables.

This step begins with (1) the specification of items used in questionnaires or databases, (2) procedures used in observations, or (3) definitions of variables. Procedural verb may be used in either the passive or active voice.

Step 3: Justifying the methods of measuring variables.

In this part, the writer gives justifications in order to indicate the degree of acceptability of the research design. Citing previous research is an important step that can help future researchers replicate or modify the study. The methods are highlighted as those that have been tested and proven in prior research.

Moreover, writers indicate the extent to which certain procedures are justifiable by highlighting the acceptability of some methods of measurements. For this step, a more overt way of indicating methodological acceptability is to make specific reference to the validity and/or reliability of a method for measuring variables.

Move 3: Elucidating data analysis procedure/s

Subsequent to the delineation of procedures for measuring variables, the writers may continue to elucidate the data analysis procedures by describing some statistical techniques aimed at: (1) analyzing data, (2) testing the research hypotheses, and (3) seeking answers to the research questions.

Step 1: Relating (or recounting) data analysis procedure/s

The focus in this section is on the steps taken in analyzing the data. The steps taken in the process of data analysis are usually recounted in chronological order.

The most salient features of Move 3-Step 1 are (1) the use of time-relationship adjuncts (e.g. "first", "second", "then", "finally"), (2) temporal adverbial clauses that indicate the completion of a particular step taken in analysis, and (3) lexemes denoting inception of a process (e.g. "started" and "start-ing").

Step 2: Justifying the data analysis procedures

In this step, writers provide a rationale for selecting certain analysis procedures in order to demonstrate that the data have analyzed in appropriate way.

Step 3: Previewing results

This part resembles certain steps found in the subsequent result section in that the data reported appear like preliminary results that can be further interpreted to produce specific findings.

METHODOLOGY

Both qualitative and quantitative methods were applied in this study. The rhetorical analysis was used as research design. Specifically, the rhetorical moves in the rationale of the study and methodology was analyzed

Table B*Lim's model (2006) for RA Methods*

Rhetorical Move	Constituent step
Move 1: Describing data collection procedure/s	Step 1: Describing the sample (a) Describing the location of the sample (b) Describing the size of the sample/population (c) Describing the characteristics of the sample (d) Describing the sampling technique or criterion Step 2: Recounting steps in data collection Step 3: Justifying the data collection procedure/s (a) Highlighting advantages of using the sample (b) Showing representativity of the sample
Move 2: Delineating procedure/s for measuring variables	Step 1: Presenting an overview of the design Step 2: Explaining method/s of measuring variables (a) Specifying items in questionnaires/databases (b) Defining variables (c) Describing methods of measuring variables Step 3: Justifying the method/s of measuring variables (a) Citing previous research method/s (b) Highlighting acceptability of the method/s
Move 3: Elucidating data analysis procedure/s	Step 1: Relating (or recounting) data analysis procedure/s Step 2: Justifying the data analysis procedure/s Step 3: Previewing results

using Swales' (1990) Create a Space Model (CARS) and Lim's (2006) rhetorical framework for methodology, respectively.

Research Environment

This study was conducted in the University of San Carlos where most of the theses of the graduates of the Master of Arts in Applied Linguistics (MAAL) are accessible. Some copies were retrieved from the Filipiniana Li-brary JB Learning Resource Center while others are from the authors who are also faculty members of the said university.

Research Data

All graduate theses, a total of 22, of the MAAL program from 2005 to 2018 served as data. Particularly, sections on introduction and methodology were looked into in terms of rhetorical moves, disciplines, theoretical frameworks and research designs. These theses employed topics ranging from phonetics and phonology, morphology and syntax, semantics and pragmatics, discourse, second language acquisition and bilingualism.

Research Procedures

Gathering of Data. Before gathering the data, the researchers asked a complete title list of the MAAL program graduate theses from 2005 to 2018 from the University of San Carlos library. The researchers then contacted and wrote a transmittal letter to ask permission from the theses owners to use their theses as part of the research data. The introductions and methods sections of 22 graduate theses of the MAAL program from 2005 to 2018 were compiled, photocopied and retyped for the purpose of analysis. The different rhetorical moves evident

in the introductions and methods sections in the graduate theses were identified, tallied, and tabulated.

Treatment of Data. The data were analyzed using both quantitative (frequency count) and qualitative (content-based) analyses. To identify the Moves that characterize the MAAL theses, a total 22 Introduction and Methodology portions of the theses were individually analyzed using Swales' (2004) CARS Model and Lim's (2006) framework. For the methods sections, the framework of Lim (2006) was used to do a move-based genre analysis to determine the moves and steps found in the method sections. The researchers looked into the occurrences of steps. The next step was to account for the percentage of the presence of these rhetorical moves in the introduction and method section. The rhetorical moves were coded, classified, and tabulated according to the categories specified in the sub-problems. For data coding and analysis, each of the researcher tabulated, coded, and analyzed the 22 MAAL graduate theses. Then, the researchers discussed together and verified one another's analyses of the data. Other possible rhetorical moves that are distinct in MAAL theses were also looked into.

RESULTS AND DISCUSSION

Table 1 shows that discourse analysis, pragmatics, conversation analysis together with second language acquisition and bilingualism especially code-switching were explored by the thesis writers. These could be attributed to the fact that discourse analysis and conversation analysis are approaches in data analysis. According to Heritage (1984, p. 245 in Hua, Wei and Yuan, 2000 p. 85), conversation analysis is "primarily concerned with the ways in which utterances accomplish particular actions by virtue of their placement and participation with sequences of actions.... (p. 85).

Pragmatics, Second Language Acquisition, and Bilingualism are observed to be very relevant topics to these writers due to the language setting in Cebu where speakers are usually bilinguals and multilinguals. Such researches that look into multilingualism contribute to the stakeholders' understanding of the importance of mother tongue-based multilingual education (MTBMLE) specifically in terms of pedagogical strategies. Others also choose topics where they could easily gather data due to the time constraint and deadlines given to the writers who need to finish their master's degree. This directive was also mandated by the Commission of Higher Education.

CHED Memorandum Order (CMO) No. 40, s. 2008 required all higher education institutions (HEIs) faculty to have at least a master's degree that was implemented by AY 2011-2012 ("Faculty Development Program", 2017).

Moreover, the following disciplines that need to be explored are: *Critical Discourse Analysis, Modern Grammar/Grammatical Theories, Acoustics & Cebuano*. As observed in the research agenda of DCLL before it was revisited during 1st semester 2017-2018, critical discourse analysis was not included in Linguistics probably because this discipline is very challenging. Also, the

Table 1

Disciplines/Courses in the MAAL Theses

Courses	f	Theses Samples
(i) Discourse Analysis		
Political Discourse	1	T1
Narratives	3	T2, T13, T17
Discourse Markers	1	T9
Fillers/Verbal Mantra	2	T11, T16
Other subfields	2	T8, T15
Sub-total	9	
(ii) Pragmatics		
Politeness	2	T2, T8
Speech Acts	2	T3, T19
Apology	1	T19
Humor	1	T22
Sub-total	6	
(iii) Conversation Analysis	4	T1, T9, T16, T22
(iv) Second Language Acquisition	4	T7, T13, T14, T21
(v) Bilingualism: Code Switching	4	T4, T13, T15, T2
(vi) Syntax	3	T1, T10, T12
(vii) Language and Gender	3	T7, T16, T22
(viii) Varieties of English (World Englishes; Philippine Englishes)	3	T12, T6
(ix) Introduction to Language Study	2	T4, T21
(ix) Anthropological Linguistics	2	T4, T21
(x) Sociolinguistics: Language Choice and Language Shift	2	T4, T20
(xi) Advanced Phonetics and Phonology	2	T6, T7
(xii) Semantics: Collocation	2	T3, T5
(xiii) Morphology	2	T10, T20
(xiv) Advanced Composition	2	T12, T14
(xv) Methodologies of Teaching	2	T14, T21
(xvi) <i>Critical Discourse Analysis</i>	1	T5
(xvii) <i>Modern Grammar/Grammatical Theories</i>	1	T12
(xviii) <i>Acoustic analysis</i>	1	T7
(xix) <i>Cebuano</i>	1	T10
*(xx) <i>Assessment</i>	-	
*(xxi) <i>TESOL</i>	-	
*(xxii) <i>Psycholinguistics & First Language Development</i>	-	
*(xxiii) <i>Theories in Translation</i>	-	

*multiple answers

areas in *Grammar, Advanced Phonetics and Phonology* where acoustics could be integrated, and Cebuano were understudied. The lack of tools, training, and expertise in acoustic study as well as the lack of academic mastery in one's own Cebuano language could be a factor in the non-preference for a grammatical field of study.

The result further implies that these topics/disciplines are very technical that other thesis writers tend to avoid these topics. For Cebuano, only Enricuso (2015) attempted to deal with it while in fact Cebuano is very relevant to the K to 12 Basic Education Program (RA 10533). The rarity of studies in Cebuano could be attributed to its exclusion in the list of courses in the master's degree program of Applied Linguistics but is now offered in the undergraduate program of Applied Linguistics.

In addition, courses and topics in *(Language) Assessment, TESOL, Psycholinguistics and First Language Development, and Theories in Translation* that are evident in the latest prospectus of the Master of Arts in Applied Linguistics program of DCLL, which took effect during the AY2014-2015 were never yet explored by the thesis writers. This result suggests that thesis writers venture into these unexplored areas relevant to competencies mandated by Department of Education for Kindergarten, Grades 1-4, Grades 11-12 on the successful implementation and evaluation of the K to 12 policy and TESOL that is trending in acquiring certification to apply for teaching jobs within the country, any ASEAN countries with the implementation of ASEAN integration. Moreover, Psycholinguistics and First Language Development could be integrated in K to 12 implementation, and Translation Studies supporting globalization and internationalization and the preservation of cultural heritage through literary and non-literary texts.

The data in Table 2 reveal that the elements of Labov (1999) and Labov and Waletzky (1967) were found to be very overused in analyzing the narrative structures; code-switching, the categories of Poplack (e.g. Poplack,

1980; Poplack & Sankoff, 1988) and politeness was also explored in various frameworks. Despite being commonly utilized, Labov's (1999) framework of the narrative structures paved the way for thesis writers in their analysis of narratives. This repetitive usage of frameworks suggests the "existing weaknesses and gaps of a particular field in the member of a disciplinary community" (Shezad, 2008 in Amir, Darus, & Rahman, 2017). By knowing the uncovered and identifying other current frameworks, the discipline of applied linguistics could continue to move forward.

Concerning code-switching, Poplack (1980) has been well used even though there have been other researchers such as Pascasio (1988), Bautista (n.d.) and Gonzalez (n.d.) who already categorized code-switching in the Philippine context. This demonstrates how thesis writers are still attached to the theories developed by foreign researchers through benchmarking. This result suggests that master's thesis writers should be confident to contribute to theory building than using theories developed abroad. New theories which were developed by Filipino researchers could be utilized in the Philippine context. To support this claim, Barabas (2017), Enricuso (2016) and Unabia (2017) contributed to the building of theories through benchmarking and coming up with new categories based on their actual data.

Table 3 demonstrates that the majority of the master's theses used the quantitative-qualitative research design. This has now become a trend in conducting research in combining quantitative and qualitative research designs to validate the results. Most researchers tend to use the mixed quantitative and qualitative methods in supplementary or complementary forms. Dornyei (2007) indicates that qualitative methods direct the quantitative and the quantitative feedback into the qualitative in a circular and evolving process with each method contributing to the theory in ways that only each can. The use of converging trends from quantitative data and specific details from qualitative data contribute to a

Table 2

Frameworks Used in the MAAL Theses

Topics	Frameworks/Theories	Theses
Narrative Structures	Labov & Waletzky (1967)	T2
	Labov (1999)	T13
Code-switching	Poplack (1980);	T13
	Poplack & Sankoff (1988)	T15
	Hammink (2000)	T15
	Fuentes (2005)	T15
Philippine Code-switching	Pascasio (1988)	T15
Politeness strategies	Holmes (1995)	T2
	Brown & Levinson (1987)	T8
	HO (n.d.)	T8
	Maynard (1980)	T8
Advertisement Context	Cook (2001)	T1
Emotive effects and legitimizing strategies	Chilton (2004)	T1
Collocation	Crystal (1995)	T3
Collocation classification	Kalediate & Palevicienne (2008)	T3

Speech act	Searle (1976)	T3
Textual analysis	Fairclough (1993)	T5
Rhetorical moves	Hui (2009), Askehave (2007)	T5
	Hajibah (2006)	T5
Intelligibility	Field (2005)	T6
Accommodation Theory	Gilbert and Coupland's (1991)	T7
Taxonomy of discourse markers	Fraser (1999)	T9
Types of pragmatic functions	Verdonik (2007)	T9
Communicative functions	Wray & Perkins (2000)	T10
Ritual insults	Labov (1972)	T10
Syntactic categories	Bygate (1988)	T10
Routines or frames identification	Raupach (1984)	T10
Formulacity of the identified language	Moon (in Schmitt 1997)	T10
Function/case frames	Fillmore (1968)	T12
Misuses and use	Brown (2000)	T12
Interlanguage	Selinker (1960)	T13
Rating Scale for revisions	Ferris (1997)	T14
Survey questionnaire (modified)	Straub (1997)	T14
Elements of genre	Moon (1985)	T15
Types of sermons	Sermon (2009)	T15
Types of talk	Fisher (1993)	T16
Verbal Communicative behaviors	Dindia and Pearson (1995)	T16
Coding Categories	Ely <i>et al</i> (2001)	T17
Lexical access in speech production	Costa, Colome and Caramazza (2001)	T20
Form al and functional features of teacher talk	Chaudron (1988)	T21
Taxonomy of humor	Monro (1953)	T22
Discursive norm	Mullany (2004)	T22
Semantic script	Rasken (1985)	T22
Maxims violated to effect humor	Attardo (1993)	T22

bet-ter understanding of complex phenomena such as language use. In addition, the nature of applied linguistic research-es tend to emphasize various approaches to conceptualizing, analyzing and representing knowledge about language and at the same time embracing new contexts of language learning and use (Kaplan, 2010). Quantitative approach is usual-ly linked to experiments and surveys while qualitative method is associated with ethnography, case study, and narra-tive inquiry in applied linguistics. Further, thesis writers and researchers could easily explain with the prevailing pat-terns found in the data. Nevertheless, exposure to other methods of research design could further enrich data gathering and analysis.

As observed, only a few used correlational (Socong, 2010) and grounded theory (Unabia, 2017), and none of the thesis writers used experimental research design. This could be attributed to the research interests of the thesis writers where only few of them took the challenge in exploring correlational and grounded theory. It was very chal-lenging and time-consuming to use grounded theory because the researchers had to focus on occurrences in the local study and data rather than referring to the established categories developed by the theorists. Since Psycholinguistics and first language acquisition were not

given much attention as shown in the topics selected, experimental research designs could be used in testing hypotheses in relation to language acquisition and specific topics of Psycholinguistics.

Rhetorical Moves in MAAL Introduction

Swales's (1990) framework on the rhetorical moves in research paper introductions is a practical guide for researchers to write their introduction clearly and convincingly. It guides readers in understanding the context of and available knowledge on the topic, the reason(s) why there is still a need to conduct further investigations regarding the topic, and the ways in demonstrating how to fill in the research space (e.g. how to fill the gap or continue the research tradition). Table 2 presents the moves applied in the master's thesis introduction section while Table 2.1 summarizes the theses incorporating the moves as well as the respective steps.

As illustrated in Table 4, all master's theses (T1-T22) employed Swales' (1990) three 'moves' in writing an introduc-tion with M1(S1A) – M2(S1B) – M3(S1A) as the most prevalent pattern. Clearly, the researchers were able to estab-lish the importance and relevance of the research

Table 3

Research Designs Used in the MAAL Theses

Research Designs	f	Theses
Quantitative-Qualitative	14	T3, T4, T5, T6, T7, T8, T10, T12, T13, T14, T16, T20, T22
Qualitative-Descriptive (Descriptive/ Descriptive-Comparative Non-experimental)	9	T1, T15, T19, T21, T2, T9, T17, T11, T18
Correlational research	1	T18
Grounded Theory	1	T21
Experimental	-	

Table 4

Rhetorical Moves in Research Introductions

Theses	Move Sequence	MOVE 1: Establishing a Territory	MOVE 2: Establishing a Niche	MOVE 3: Occupying the Niche	Total
T1	M1(S1), (S2) – M2 (S1B) – M3 (S1A)	1	1	1	3
T2	M1(S1), (S2), (S3) – M2(S1D) – M3 (S1A)	1	1	1	3
T3	M1(S1), (S3) – M2(S1B) - M3 (S1A)	1	1	1	3
T4	M1 (S2), (S3) – M2(S1B) - M3(S1A)	1	1	1	3
T5	M1(S1), (S3) – M2(S1D) – M3(S1A)	1	1	1	3
T6	M1(S1), (S3) – M2(S1B) – M3(S1A)	1	1	1	3
T7	M1(S1), (S2), (S3) – M2(S1B) – M3(S1A)	1	1	1	3
T8	M1(S3) – M2(S1A), (S1B) – M3(S1A)	1	1	1	3
T9	M1(S2), (S3) – M2(S1D) – M3(S1B)	1	1	1	3
T10	M1(S1), (S3) – M2(S1B) - M3(S1A), (S1B)	1	1	1	3
T11	M1(S1), (S3) – M2(S1B) – M3(S1A)	1	1	1	3
T12	M1(S3) – M2(S1B) – M3(S1A), (S1B)	1	1	1	3
T13	M1(S2) (S3) – M2(S1B) – M3(S1A), (S1B)	1	1	1	3
T14	M1(S2), (S3) – M3(S1A)	1	1	1	3
T15	M1(S2), (S3) – M2(S1B) – M3(S1A)	1	1	1	3
T16	M1(S1), (S3) – M2(S1B) – M3(S1A)	1	1	1	3
T17	M1(S3) – M2(S1B) – M3(S1A)	1	1	1	3
T18	M1(S1), (S3) – M2(S1B), (S1C) – M3(S1A), (S1B)	1	1	1	3
T19	M1(S1 – S3) – M2(S1B), (S1D) – M3(S1A)	1	1	1	3
T20	M1(S1), (S3) – M2(S1B) – M3(S1A)	1	1	1	3
T21	M1(S2), (S3) – M2(S1B) – M3(S1A), (S1B)	1	1	1	3
T22	M1(S2), (S3) – M2(S1B), (S1D) – M3(S1A)	1	1	1	3

*T1-T22 refers to MAAL Thesis

area, indicate the need to add to the existing knowledge, and demonstrate how the need can be substantiated. Varied steps under those moves were observed to be evident: Under Move 1, Step 3 [Reviewing items of previous research] occupies the most number of usage (i.e. 22 out of 22), followed by Step 1 [Claiming Centrality] and Step 2 [Making Topic Generalization]; For Move 2, Step 1B [Indicating a Gap] tops the spot with 18 out of 22 usage; and lastly, for Move 3, Step 1A [Outlining the Purposes] garners the highest number of use with all thesis (i.e. 22 out of 22) stating the nature of the present research. Since all obligatory moves were utilized, these researchers are assumed to be well-versed in laying out the background

of the study. As emphasized by Swales (1990 in Rahman, Amir & Darus, 2017), “the functional role of introduction of RAs (Research Articles) is to situate them contextually in a research study by discussing the literature relevant to the study, by presenting the originality of the study, and also by describing principal aspects of the study”.

Data reveal similar findings with those of Fazilatfar and Naseri (2014) where the 3 moves in the introduction section occurred frequently with minimal variation in the order such as the occurrence of presenting the present work immediately after the first move, establishing a territory. As observed in the present study, despite differences in

steps used in each move, the common pattern still starts with Move 1 followed by Move 2 and Move 3 establishing a coherent section.

Table 5 specifies the steps under each move with S3 [Reviewing items of previous research] having the most number of usage (22 out of 22 theses) under M1 [Establishing a Territory] and S1A [Outlining purpose] of M3 [Occupying the Niche]. Reviewing related literature is important in research writing since it establishes the relevance of the field of study and provides a better understanding of the concepts, methodologies and techniques of the discipline. The focus of the review allows the discussion of certain areas, methods and findings that may be replicated or further explored. As observed, these thesis authors find it essential to incorporate their analyses and synthesis of research literature to demonstrate the contribution of their work to the body of knowledge. Although M2 [Establishing a Niche] was also utilized, not all theses exhibit the application of the same step. In this case, S1B [Indicating a gap] has the majority shares (18 out of 22) which indicate that researchers identify the need to conduct a research investigation or contribute additional knowledge to the community because a gap (e.g. in the methodology, context, or framework) needs to be filled in. The need to identify areas which have not been researched surfaced in the process of reviewing the literature where the gap is revealed. This study supports the findings of Fazilatfara & Naserib's (2014) study where indicating a research gap predominated among the steps.

On the other hand, some steps from M3 [Occupying a Niche] were observed to be absent particularly in S2 [Announcing principal findings] and S3 [Indicating RA structure]. Unlike S1A or S1B, these two (i.e. S2 and S3 of M3) are optional; thus, researchers exclude them in the introduction. Moreover, announcing the principal findings of the research will already be made available in the succeeding chapters (i.e. Chapter 2 for the presentation, analysis and interpretation of data, and Chapter 3 for the

summary of findings). Although this strategy emphasizes the main results of the study by placing the report in the introduction, not all disciplines allow its inclusion in the said section (Pennington, 2015). Three theses have, however, projected what their study attempts to achieve as presented in T5:

T5: The results of the study may further enhance the contents of these brochures in terms of rhetorical moves, verbal phrase, and word combinations

Furthermore, the nonexistence of indicating the research article structure indicates that there is no need to explicitly mention the structure of the paper, unlike other disciplines, since the main goal of the introduction section is to point out why the study needs to be conducted in the first place which was already achieved following the three moves. The result also implies that the thesis writers had to be acquainted with Swales' (1990) rhetorical moves to enrich their skill in writing the introduction or rationale of the papers. However, presenting the flow of research in this section can easily guide readers.

Below are examples of the application of rhetorical moves in the introduction taken from the gathered data.

M1 - Establishing a Territory [the situation]

Authors set the tone or context of their research to give readers a background or layout of the topic including its importance and relevance. This move is employed using one or more of these steps:

S1. Claiming Centrality

T13: Another phenomenon that is of great importance in the field of language transfer in the learning of second language is crosslinguistic influence (CLI) which was first popularized by Weinrich (1953 in Ilomaki, 2005) then investigated further by Lado (1957 in Malmkjær, 2004).

Table 5

Summary of Rhetorical Moves in Research Introductions

Move 1: Establishing a Territory			Move 2: Establishing a Niche				Move 3: Occupying the Niche			
Step 1: Claiming Centrality	Step 2: Making topic generalization	Step 3: Reviewing items of previous research	Step 1A: Counter Claiming	Step 1B: Indicating a gap	Step 1C: Question raising	Step 1D: Continuing a Tradition	Step 1A: Outlining purposes	Step 1B: Announcing present research	Step 2: Announcing principal findings	Step 3: Indicating RA structure
T1, T2, T3, T5, T6, T7, T10, T11, T16, T18, T19, T20	T1, T2, T4, T7, T9, T13, T14, T15, T19, T21, T22	T1-T22	T14	T1, T3, T4, T6, T7, T8, T10, T11, T12, T13, T15, T16, T17, T18, T19, T20, T21, T22	T2, T18	T2, T5, T9, T19 and T22	T1-T22	T3, T9, T10, T12, T13, T18 and T21	None	None
12 Thesis	11 Thesis	22 Thesis	1 Thesis	18 Thesis	2 Thesis	5 Thesis	22 Thesis	7 Thesis	None	None

*T = thesis

Majority of the thesis (12 out of 22) employed S1 since it gives the topic a level of importance and significance. Re-searchers would point out that the research topic is worth looking into. As exemplified by T13, crosslinguistic influence and written commentary on student writing are well-established researched topics since these have been investigated by other experts in the field. Academic Writing in English (2017) even pointed out that centrality claims frequently "serve as *topic sentences* and are therefore usually followed by evidence to support this statement"

S2. Making topic generalization(s)

T16: classroom talk studies **generally** focus on conversations in the classroom setting between the students and the teacher rather than among students alone

Aside from claiming the significance of a topic, making generalizations of such topic was also evident with 11 theses illustrating this step. Here, statements concerning 'current state of either knowledge concerning practice or description of phenomena' are found. Phrases such as *generally accepted, well known/documented, common findings* and such contribute to the identification of such step. T16 illustrates this strategy.

S3. Reviewing items of previous research

T8: **Petitti (2010)** studied the politeness theory in online communication spontaneous talk

As indicated in Table 2.1, all introduction sections of MAAL theses reflect a review of the previous research relating what has been found and who has found it. Evaluating experts' opinions and claims are valuable in supporting the argument and rationale of the study under investigation; hence, the researchers included these in establishing why the topic needs to be explored. Referring to previous research is represented by citing the author(s), date of research publication, useful verbs such as *suggest, study, and adopt* followed by an explanation on their views. These views can either support or counter the present study which contributes a holistic element to the discussion. In terms of format, this step is different from reviewing related literature where studies are presented in an abstract manner. The variation of writing styles suggests that the perspectives of the thesis writers could be widened as they are exposed to a genre. Bhatia (1997 in Fazilatfara & Naserib, 2014) emphasized that novice writers can benefit from the results of genre analysis because they can generate more complex genres.

Move 2: Establishing a Niche [the problem]

In order for the current study to find its relevance and significance in the field, it must establish that there are aspects in previous reports or investigations that have not been addressed. One way of incorporating this move is pointing out oversights of existing study by using 'negative evaluation'. Swales and Feak (2004 in Tulpesh, n.d.) suggested several phrases that might be helpful in establishing a niche such as 'Quasi-negative' phrases (e.g. however, little information/few studies), contrastive phrases (e.g. these studies have emphasized..., as opposed

to...), raising a question/hypothesis/a need (e.g. however, it remains unclear whether), and ways to show extension of previous knowledge (e.g. It is of interest to compare...). Although this move gives the researchers the opportunity to claim a niche for their research by showing that previous studies are incomplete or need further investigation, not all theses exhibit this.

Data show that one or 2 steps, particularly that of indicating a gap, have been utilized.

S1B Indicating a gap

T3: However, **there is a scarcity** of related literature on studies involving the environment within the context of applied linguistics

S1B frequently follows M1 – S2 (Making topic generalizations) (Pennington, 2005). Key words such as "...has been extensively studied. However, less attention has been paid to...; Despite the importance of... few researchers have studied; Research has tended to focus on... rather than..." were used in identifying how to indicate a gap in the field. 18 out of 22 theses explicitly pointed out that a gap exists in previous research; thus, the need to establish the importance of conducting the present study. As shown in example T17, the limited number of local studies seems to demand this call for a research investigation which is usually the case in other theses. Although the procedure is repeated or the topic is similar, replication is one way of confirming the findings and contextualizing the results in the local arena. Another reason for asserting the need to study a topic is its dearth in a different context (T3).

S1C Question-raising

T2: As Holmes (1995:1) investigated the relationship of gender and politeness, she said that "Women tend to be more polite than men" but to prove that 'women are more polite than men' among Filipinos is a **corollary generalization**. The reason why this study needs to be conducted is to find out what local empirical data can be gathered to confirm this claim.

Raising a question about previous researches was seldom applied in establishing a niche since only two out of 22 theses were observed to have identified this step. The ambiguous and doubtful findings that arise from other literature's claims may still be contested due to variation in cultural and societal background. In this case, the results of existing studies may either be supported or opposed in light with new findings and other contributing factors. Lio and Evans (2010 in Fazilatfara & Naserib, 2014) claimed that generic awareness would aid novice writers in both generating complex genres and enjoying the explicit knowledge of genre organization.

S1D. Continuing a tradition

T9: Consequently, the **researcher found it interesting** to look into the kind of pragmatic function which is evident in the discourse markers used by the speakers following the framework of Verdonik et al. (2007).

Continuing a tradition presents the research as a

'useful extension of existing research' (Swales, 1990) and is frequently signaled by logical connectors, such as *therefore, hence, consequently, or thus* (Pennington, 2005) which are helpful in one's line of reasoning. Using S1D strategy signals the necessity to examine further studies in line with existing studies albeit different framework, methodology, or contexts. However, this step is seldom used in MAAL theses (i.e. only 5 out of 22) perhaps because the gap that is intended to be filled in has already been pointed out (in S1B) by most researchers.

Move 3: Occupying the Niche [the solution]

After establishing a niche, writers have to reveal their solution how they can help fill the gap, answer specific questions or continue a research tradition. Using Move 3 already guides the readers how the research space can be occupied by outlining the purpose or aim of the current study. Tulpesh (n.d.) pointed out two main ways to occupy the niche particularly, by indicating the study's purpose (i.e. purposive), and describing the main feature of the research (i.e. descriptive). Swales (1990) also revealed that S1A or S1B is obligatory.

S1A. Outlining purposes

T1: That is why the **present study aims** to investigate what empirical data can be obtained to analyze the discourses of televised political campaigns.

S1B. Announcing present research

T18: The **study focused** on apologies on campus, for it is believed that the school is one of the major institutions that teach proper manners like politeness.

An alternative strategy to S1A of M3 is announcing present research (S1B) where the writer 'describes the aims in terms of what the research sets out to do or accomplish' (Pennington, 2005). Phrases such as *'we suggest/propose/attempt/provide/describe/present as well as this study evaluates/presents/focuses/tests/proposes/introduces* **guide readers** in identifying how they occupy the niche.

To sum up, data from 22 MAAL theses indicate that the three rhetorical moves were applied in writing the introduction section with M1(S1A) – M2(S1B) – M3(S1A) as the most prevalent pattern indicating that the researchers were able to establish the importance and relevance of the research area, indicate the need to add to the existing knowledge particularly by filling in the gap in the research field, and demonstrate how the need can be substantiated by outlining the purpose of their research study. Certain phrases also prove useful in identifying the rhetorical moves and their corresponding steps.

Rhetorical Moves in Methodology Section

The methodology section is another challenging part of any research project because this is where the process of accomplishing the need to occupy the niche is presented in detail. Rosal (2008) pointed out that "this portion of the research process is pivotal as it endows the research with a scientific aura, that the steps taken to answer specific problems are well thought of, and not

haphazardly nor hastily done" (p. 73).

Moreover, Lim (2006 in Soodmand Afshar and Ranjba, 2017) added that this section is "worth investigating since it functions like a thread that links a particular research method with previous methods of research or with other sections, especially with the introduction and result sections" (p. 48). Using Lim's (2006) framework in analyzing the method section is practical since he is the only person, as of 2008, to provide a "detailed move-and-step analysis linked to linguistic features" (Bruce 2008, in Soodmand Afshar and Ranjba, 2017:49). Table 3 where the rhetorical moves in MAAL theses' methodology section appears on the succeeding page.

Table 6 shows that all three rhetorical moves were applied in the theses' methodology section. Although all theses (i.e. T1 – T22) described the location (M1S1A) and size (M1S1B) of the sample/population as well as recount-ed steps in data collection (M1S2), presented an overview of the research design (M2S1) and related data analysis pro-cedures (M3S1), some steps under those moves are absent such as defining variables (M2S2B), describing methods of measuring the variables (M2S2C), highlighting the acceptability of the methods (M2S3B) and previewing the results (M3S3). The absence of these steps (i.e. M2-S2B, M2-S2C, M2-S3B, and M3-S3) could indicate that researchers fo-cused on the basic sections enumerated in Rosal's (2008) research textbook which includes the research method (i.e. strategies/techniques/design), research environment/site, research participants/respondents, research instruments, and research procedure inclusive of the gathering of data and treatment of data.

Among the four non-science disciplines studied by Peacock (2011), language and linguistics showed the shortest and simplest methods sections. Despite its brevity, it encompasses a detailed explanation of the research sub-ject/participants/respondents and a step-by-step description of method together with the research tools and materials and procedures - from gathering to analysis and interpretation of data. The research aims, hypothesis and limitations are also stated. Peacock (ibid) described the inclusion of these sections as a "discipline convention".

Evidently, a pattern is observed among the methodology sections of MAAL Theses: M1 [S1 (A-B-C-D) - S2] + M2 [S1] + M3 [S1]. First, an overview of the research design serves as the introductory paragraph where either a qualitative, quantitative, or mixed method is used. Second, the research environment explains where the data are collected or where the study is conducted. Third, the research participants/respondents/data are identified and described together with the sampling method (e.g. cluster, purposive, non-probability) used in gathering this sample popula-tion/data. Fourth, the research instrument or tools indicate the materials utilized in gathering data. Lastly, the research procedure specifies how the data are gathered and treated. Gathering of data involves the explanation of how and what kinds of data are collected while the treatment of data specifies what is being done to the gathered data including sort-ing, tallying for frequency occurrences, converting to percentages, computing statistical data, constructing tables or charts,

Table 6

Rhetorical Moves in Research Methodology

Move 1: Describing data collection procedure/s				Move 2: Delineating procedure/s for measuring variables				Move 3: Elucidating data analysis procedure/s															
Step 1: Describing the sample				Step 2: Recounting steps in data collection				Step 3: Justifying the data collection procedure/s															
Step 1: Presenting an Overview of the design				Step 2: Explaining method/s of measuring variables				Step 3: Justifying the method/s of measuring variables															
Step 1: Relating (or recounting) data analysis procedure/s				Step 2: Justifying the data analysis procedure/s				Step 3: Previewing results															
A. Describing the location of the sample	B. Describing the size of the sample/population	C. Describing the characteristics of the sample	D. Describing the sampling technique or criterion	A. Highlighting advantages of using the sample	B. Showing representativity of the sample	A. Specifying items in questionnaires /databases	B. Defining variable	C. Describing methods of measuring variables	A. Citing previous research method/s	B. Highlighting acceptability of the method/s	T1-T22	T1-T22 except T10 and T18	T1-T22 except T3 and T12	Only T1, T4, T17, T22	Only T1, T4, T18, T20	T18	None	None	T4, T14 and T22	None	T1-T22	T1, T2, T4, T5, T15, T18, T20, T21	None

ranking, analyzing and interpreting. Since most if not all the researchers were under the tutelage of the author of a technical writing book used in the thesis writing course, the same steps have been employed in the Methodology section. In the same way, the Philippine Association for Graduate Education Region 7 (n.d.) provided guidelines in writing the thesis to the Higher Education Institution in the region as part of their project led by the late Dr. Saniel who was the former president of PAGE 7.

Few exceptions in Step 1 of Move 1 were identified where T10 and T18 exclude describing the characteristics of the sample, and where T3 and T12 exclude describing the sampling technique or criterion.

Move 1: Describing data collection procedure/s

S1A. Describing the location
T2: This study was conducted in Cebu Institute of Technology (CIT), located in Norberto Bacalso Avenue, Cebu City along the Cebu South Express Hiway.

Clearly, as observed in all MAAL theses, to establish where data are collected or where the research is conducted, describing the location is prerequisite to describing the data. Rosal (2008) pointed that the description of research

environment “is equally important for it complements the appropriateness of the site to the study” (p. 76). Most of the location described in the study occurred within the school context such as the one exemplified in T2 (i.e. CIT). However, aside from the physical entity, describing the location may also mean the source where the data are retrieved such as the one indicated by T15 (i.e. TV stations Channels 3 and 47), from a Youtube website (T1), radio station (T8), brochure (T5),

S1B. Describing the size of the sample size/population
T3: Approximately, 100 green advertisements were collected and studied

Since the discipline does not require experimental method, unless of course the topic is on psycholinguistics which did not occur, most if not all data revolve around participants/respondents or printed materials such as essays, advertisements, brochures, or newspapers which are simply counted. Obviously, all writers specified the sample size/population of their study. Sampling, the process of choosing the participants, could either be probability or non-probability where the latter is preferred in the theses particularly for qualitative data. According to Rosal (2008), non-probability includes convenience/haphazard (where individuals are available and willing),

purposive/judgmental (where individuals fit criteria laid down by the researcher), and quota (where individuals are grouped and a quota from each group is set). Majority of the data indicate a combination of these samplings.

S2. Recounting Steps in Data Collection

T12: From each school, **essays of 200–250 words were collected from 150 students.** These essays were converted to digital text format by encoders. These texts then served as the corpus inputted into the corpus-analysis tool.

As the name suggests, recounting steps in data collection is simply enumerating the steps in gathering data which is evident in all MAAL theses. In a research textbook utilized by the writers under the MAAL program, gathering data is paired with the treatment of data under the research procedure section. This step allows not only the writers but the readers, especially the panel members, an overview on how the data will be collected and if such procedure is feasible. During proposal hearing, the research methodology is one of the most challenging sections to defend since its planning and implementation is vital in the desired outcome of the study. Transition phrases enumerating steps such as *'first, second...; ...and then...; Consequently...'* are useful in achieving coherent paragraphs. Although Zhang & Wannaruk (2016) used Pho's (2008a in Zhand & Wannaruk, 2016) framework, they found the predominance of data collection procedures in their study which are quite similar to the present study. The results imply that the research procedure is very essential in writing the paper since the readers would tend to read the methods and learn from the articles whether the method could be replicable or not.

Move 2: Delineating procedure/s for measuring variables

S1. Presenting an overview of the design

T4: This study employed **mixed methods** research design with concurrent embedded strategy identified by the use of one data collection phase, during which both quantitative and qualitative data were collected simultaneously (Creswell, 2009).

All theses (T1-T22) present the overview of their research design in the introductory paragraph of their methodology section. Most studies deal with a triangulation technique where the qualitative-quantitative method is applied. According to Rosal (2008), "a combination of textual impressions and generalizations would be more credible when backed up by numerical data; in the same way, purely numerical information would be rendered more understandable when supported/elaborated by textual analysis" (p.74).

Move 3: Elucidating data analysis procedure/s

S1. Recounting Data Analysis/Procedure

T11: After gathering the profiles of the students, the researcher identified the qualified participants who were included in this study. After the participants presented their verbal narrative, the researcher analyzed each of the narratives. The words, which were considered isolated linguistic mantra, were

categorized according to their functions such as filler words, hedges and boosters. The occurrence of the isolated linguistic mantra were tallied and tabulated. The results were then subjected to a frequency distribution table.

As mentioned, research procedure in Rosal's (2008) research textbook comprises the gathering of data and treatment of data where the former details how the data are gathered while the latter enumerates what to do with the gathered data in order to answer the identified research problems. In Lim's (2006) framework, steps in data collection are placed in M1(S2) while steps in recounting data analysis are placed in M3(S1). Examples T11 and T12 show that data are subjected into tallying, coding, frequency count, tabulation, analyses then interpretation.

The steps identified in the treatment of data are aligned with the order of the specific sub-problems. Statistical treatment (e.g. ANOVA, SPSS, PP-MCC, Pearson Chi-square Test), software tools, and inter-raters/verifiers/translators are dedicated in this section. Further, some theses also specify the end product of their investigation such as instructional materials (e.g. T12), reinforcement material (e.g. T9), or guideline (e.g. T14). All theses used this step.

Data from the 22 MAAL theses revealed the application of the three rhetorical moves in describing their methodology section albeit different steps; however, M1 [S1 (A-B-C-D) - S2] + M2 [S1] + M3 [S1] is observed to be the prevalent pattern applied in these theses. Considering the same research textbook used in outlining this section, describing the research design (i.e. qualitative and quantitative method), environment, participant/respondent, instrument/tool, and research procedure (i.e. gathering and treatment of data) is highly crucial in guiding the research study. Similarly, all articles applied M3 (S1) in which they relate their data analysis procedure/s. Majority have also specified the location and size of sample population though not thoroughly discussed. Evidently, the MAAL theses have not given importance in discussing the variables in their study. The findings showed how the researchers justify their decisions in choosing the appropriate data and procedure that aided them in answering their respective sub-problems. Their choices in the steps to follow depend on the concepts they want to emphasize. Evidently, the rhetorical moves of a methodology section are designed to describe in details the collection and treatment of data. The use of Move 3-Step 1 in all theses revealed the critical manner of explaining the research procedure which is similar to Smagorinsky's (2008 in Cotos, Huffman and Link, 2017) observation on the explicit presentation of the procedures particularly in gathering and analyzing the data. Lim (2006) also pointed out that "while little has been written on teaching move structures, a first step to teaching them is to understand how communicative functions are linked to linguistic features".

CONCLUSIONS

Based on the findings, these are the conclusions of the study:

1. The research style preference of the MAAL theses is attributed to contributing factors: availability of data re-sources and practicability of the research topics. Also, the choice of theoretical frameworks varies depending on the goals of the researchers. It is also important to take note that however varied these frameworks are, the re-searchers are geared toward exploring and enriching the literature of the local language (Cebuano). In terms of the research design, the researches reflect a tendency to look for patterns rather than hypotheses. The research design is descriptive, exploratory, and discovery oriented depending on the researchers' purpose. The aim is to describe events, attitudes and sets of behavior in detail and depth.
2. The research introductions demonstrate organizational tendencies reflective of the rhetorical model constructed by Swales (1990) with minor variations and characteristics that come out in each steps. The identified organizational structure ensures that the intended ideas shared can help readers' understanding of new knowledge.
3. The research methods employed by the researchers are attributed to the fact that most if not all researchers were under the same tutelage of a technical writing author who conceptualize the program in the DCLL. Consequently, the researchers used the same source as their guide in organizing their research methodology. Moreover, the limited number of experts in the field is also a contributing factor to the move cyclicity evident in the research methods.

RECOMMENDATIONS

Based on the findings and conclusions, the following are recommended:

1. Master's thesis writers should try to use theories developed by Filipino researchers if possible and contribute to the theory-building.
2. The department could provide an updated index of master's theses (every time there are new MAAL graduates who submit the hardbound copies of their theses).
3. Swales' (1990) CARS Model should be introduced not only to MAAL students while writing their final paper and theses, but also to undergraduate students who are writing their theses. Further, other updated models may be explored.
4. Since the rhetorical moves in the introduction section i.e. M1(S1A) – M2(S1B) – M3(S1A) and methodology section i.e. M1 [S1 (A-B-C-D) - S2] + M2 [S1] + M3 [S1] prove prevalent in MAAL Theses, these patterns can be employed or enhanced by writers who are about to write or are in the process of writing their research manuscript. Such patterns are likewise useful for revising their manuscripts to fit journal requirements for publication.

Proposed Moves in writing the Introduction of the Master's Thesis

Move 1: Establishing a Territory [the situation] (Step 1A: Claiming Centrality)

Move 2: Establishing a Niche (the problem) (Step 1B: Indicating a gap)

Move 3: Occupying the Niche (the solution) (Step 1A: Outlining purpose)

Proposed Moves in Writing the Methodology Section of the Master's Thesis

Move 1: Describing data collection procedure/s

Step 1 A: Describing the location of the sample

B: Describing the size of the sample/population

C: Describing the characteristics of the sample

D. Describing the sampling technique or criterion

Move 2: Delineating procedure/s for measuring variables

Step 1: Presenting an overview of the design

Move 3: Elucidating data analysis procedure/s

Step 1: Relating (or recounting) data analysis procedure/s

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A Documentary Analysis of USC Linguistics Faculty Publications from 2006-2017

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ABSTRACT

This study determined and analyzed the combined unigram and bigram predominant keywords evident in the Linguistics faculty published articles, the journals where the published articles were published, and the Master of Arts in Applied Linguistics (MAAL) courses that can use the published articles. This study used the documentary analysis in analyzing the 67 published journals of USC Linguistics Faculty from 2006-2017. This study revealed that the predominant keywords are English, Discourse Analysis, and Cebuano Language, while most of the faculty published their journal articles in local journals. Moreover, the Discourse Analysis, Psycholinguistics and Multilingualism with First Language Acquisition and Second Language Acquisition and Semantics and Pragmatics in Intercultural Communication can be used in the courses of MAAL. Consequently, this study provides implications on the gaps of research that had to be filled by including the unexplored research topics in the research agenda of the Department of Communications, Linguistics, and Literature. Linguistics faculty could continue in publishing their research projects, especially in international journals.

Keywords: analysis, documentary, faculty, journals, linguistics

INTRODUCTION

Proper indexing is the means of taking advantage of the tools that make the indexer and researcher apply consistent concepts for easy retrieval of a collection of information accessed from a database (Ghazi-Mirsaeid & Masoudi, 2017). Thus, universities, companies, and organizations in the Philippines and abroad have widely taken advantage of indexing faculty publications and other needed information of the community for sharing in their local libraries, official websites, and the like. This activity is explicitly practiced in UP Engineering Library, wherein the gathered data are entered in their digital repository called DSpace, which includes storage and archiving of thesis collection, university history, and faculty publications. The University of San Carlos Library System's benchmarking in Manila on June 14-16, 2018, was a confirmation to push through the joint research project with the Department of Communications, Linguistics, and Literature to start compiling faculty publications as part of the library collections. Likewise, the Office of the Academic Affairs of Indiana University compiled the faculty presentations, published scholarly journals and creative activities annually (Indiana University Southeast, 2018). Indeed, indexing is a very important tool in searching a topic, subject, or keyword in a large volume of information experienced by LexisNexis® Congressional when redesigning their interface, allowing users to search across databases (LaGuardia, 2006). Furthermore, having large or various document collections will find indexing more valuable to facilitate the task of effective search and retrieval of the

needed information using keyword, topic, or subject (Sripathi, 2010).

The keywords used in this paper are terms consulted in the theories of the librarians' essential tools in processing materials or collections that include the Sears List (Smedy & Try, 2005) and the Library of Congress Subject Headings. These are used to standardize the assigned subject terms, just like in the library collections. Hence, keywords applied are both unigrams and bigrams having the complexity of systematizing keywords from the 67 published journal article titles using the aforementioned librarians' tools aligned to the Master of Arts in Applied Linguistics (MAAL) courses. Unigram in this study refers to one keyword, whereas bigram refers to two keywords – both from the title of the faculty published article, which are acceptable standardized keywords used as subject headings taken from the librarian's tools.

Furthermore, the Keyword-in-Context Index (KWIC) was used for Technical Literature published by Hans Peter Luhn in 1959 (Fischer, 1966) to plan for a permutation index based on titles produced by the machine. KWIC indexes and other permuted indices are also called "unconventional indexes." This paper also

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adapted the Keyword Out of Context (KWOC) system with keyword or the access point at the extreme left of its usual place at the beginning of the line; followed by the full title to provide full context; the keyword and the context are written in the same line. Thus, readers are guided to the relevant information and source they need through pertinent keywords and phrases.

Many local and international studies were conducted to document the academic papers, research outputs, and publications of varied disciplines and programs. During the 2018 Wenzao International Conference, the rhetorical moves in the Master of Arts in Applied Linguistics graduate theses used Swales's Create a Research Space Model in analyzing the introduction section (Magno, Maxilom, & Cacha, 2018). Twenty-two theses from March 2005 to March 2018 were retrieved from the university library, while soft copies were collected from the authors. Findings revealed the need to document these theses to advance local studies on applied linguistics and be accessible for students and researchers.

Further, another study assessed the student's use of the index in terms of the level of utilization, search techniques, annoyances, and rating of the helpfulness of the index (Burdeos, Lanticse, & Anud, 2017). A survey questionnaire was administered to 30% of 413 students in 11 Science and Technology undergraduate research courses during the first semester of 2015-2016. Stratified random sampling was used. Data exhibited the need for intensive instruction on searching techniques using the Digital Repository Database, but the present study documented the faculty publications in linguistics.

Scientific journals in the Philippines are likewise prone to increasing challenges such as getting listed in the master journal list and citation databases of TR, Scopus, or both, obtaining funding, reaching a wider readership, attaining higher impact factors, competing for papers, and increasing submission of manuscripts outside the Philippines (Tecson-Mendoza, 2015). One of the recommendations pointed out in meeting the international standards of a scientific journal is the indexing of Philippine journals and published articles. The present investigation accepted such a challenge to provide a list of faculty publications in linguistics.

There have been studies abroad focusing on indexed publications. The first reviewed study aimed to determine the institutional context of the produced research projects using the Bibliometric approach (Jaén, Auletta, Celli, & Pocaterra, 2018). One hundred forty-eight articles indexed in the ISI Thompson Reuters Social Science Citation Index were analyzed. The findings revealed that researches had a meager citation record. This is entirely related to the present study to focus on critical areas for future research based on the limitations.

Another study aimed to determine the faculty scholarly publications indexed in the Science Citation Index (SCI) and Scopus using the scientometric methods and social network analysis techniques (Golnessa Galyani-Moghaddam, Jafari, & Sattarzadeh, 2017). Results showed that faculty members had the most international

cooperation with colleagues who were in the USA and Switzerland. Likewise, most of the Linguistics faculty were local publications compared to international publications. Moreover, a study that focused on faculty publications from 2011 to 2015 was done in the University of Florida to investigate the alignment of the library research support with the needs of the faculty researchers. Results illustrated that the faculty published 279 articles in the last five years (Bharti & Bossart, 2016). This study is beneficial to the present study concerning the alignment of faculty publications and library collections.

On the contrary, only the recent faculty publications of the University of San Carlos were posted on the university website. The library system has not yet officially compiled all faculty publications. Hence, there is a need to conduct this study on the faculty publications of the faculty members of Linguistics in the Department of Communications, Linguistics, and Literature (DCLL), which would be the basis in indexing and compiling all faculty publications of the faculty of the entire university. This study aimed to determine and analyze the keywords in the faculty published journal articles, the type of journals chosen by the faculty researchers, and the courses of Master of Arts in Applied Linguistics that can use the published articles.

METHODOLOGY

This study used a descriptive research method, specifically documentary analysis, in gathering the published journal articles of the University of San Carlos Linguistics Faculty. The study was done at the University of San Carlos JB-LRC in finding the available list or index of journals such as the Philippine Quarterly in Culture and Society (PQCS), University of San Carlos Graduate Journal (USC GJ), Office of Research for the list of research incentive applications. Moreover, the DCLL chair and two faculty members provided a partial list of the publications, respectively.

The research data consisted of the following documents: published journals (PQCS, USC GJ) available in the university, USC Website with the DCLL faculty members' recent publications, USC Databases in ezproxy.usc.edu.ph, search engines such as yahoo.com and google.com, journals that are open access (Science publishing group, IAFOR Journal of Language and Learning, Philippine Journal of Linguistics, etc.), and National library website. A coding sheet was used in coding the data, and an informal interview with the former president of PAGE VII was also conducted to verify the classification of PAGE VII journal.

These are the following steps in gathering the data: First, the list of DCLL Linguistics faculty who published journal articles was requested. Second, the gathered softcopies and indexed journal articles from websites and journals that are open access were collated. Third, the data were analyzed, interpreted, and classified according to keywords as standardized subject headings. Fourth, the data were coded, matched, or aligned with MAAL courses and indexed based on the readings, theories, and related literature. The data were individually analyzed first, and a consensus was reached

after resolving coding disagreements. With the use of the Dewey Decimal Classification System, the University of San Carlos Humanities Librarian was also requested to verify the keywords identified by the researchers to answer the first sub-problem, aside from using Sears List of subject headings (Sears List of Subject Heading, 2004), KWIC and KWOC. The two researchers, who are both faculty members of Linguistics were also considered verifiers in MAAL courses that can use the faculty published articles. The newly-revised MAAL prospectus was used as the basis for selecting the courses for the analysis.

RESULTS AND DISCUSSION

This section provides the results and discussion after identifying at least five keywords in each of the titles of the faculty published articles. Subsequently, the extracted predominant keywords were matched with the courses of the Master of Arts in the Applied Linguistics program. The published articles can be utilized by the MAAL program and the journals where the articles were published.

3.1. Predominant Keywords in the Titles of the Faculty Published Articles

Table 1A shows the top 16 predominant keywords out of the assigned 104 terms in all the faculty published articles using the Sears List and Library of Congress of Subject Headings for standardized assigned subjects and or to fit into the courses of Master of Arts in Applied Linguistics program. The classification of 104 keywords in this study with the use of the Dewey Decimal Classification, which boils down to only four divisions, indeed gives students, researchers, and the like a common starting point in searching for a topic. The 16 predominant keywords are deliberately selected as the top frequency in the published

articles.

3.2. Clustered Keywords

Predominant Keywords

The clustered keywords referred to the grouping of the 104 terms used in the respective Faculty publications using the Dewey Decimal Classification System.

As expected, faculty publications from the Linguistics department fall under the Languages (400) category and its related divisions with 22 occurrences, as seen in Table 1B. Languages Division is followed by the Social Sciences division, Literature, and Generalities with frequencies of 17, 12, and 4, respectively. Languages cover areas of English, and other local/foreign languages (e.g., Cebuano, Japanese), Linguistics, and its subfields (e.g., Pragmatics, Psycholinguistics, Discourse Analysis, Multilingualism), Grammar (e.g., Modern Grammar), writing systems, etymology, and dictionaries. Utilizing keywords saves time, maximizes the information required, and reflects the main content of a document. Keywords are likewise useful to the "research of information retrieval, text clustering, and topic search." (Sujian, Houfening, Shiwen, & Chengsheng, n.d.)

Aside from Language, other DDC divisions cover Social Sciences (300), which look into how people live and work in society, and include topics under law, government, and institutions; Literature (800), which carries literary genres such as plays, poems, essays, and literature in foreign languages aside from rhetoric and criticism; and General References (000).

Tables 1C to 1D present the specific keywords

Table 1A

Predominant Keywords in the Faculty Publications
N=104

Predominant Keywords	*f
English	25
Discourse analysis	24
Cebuano/Cebuano Language	18
Language	17
Communication	13
Pragmatics	9
Sociolinguistics	9
Issues and trends	8
Multilingualism	7
Bisaya	6
Bilingualism	5
Education	5
Linguistics	5
Speech acts(Linguistics)	5
Grammar/Grammatical theories	4
Psycholinguistics	4

**multiple responses: frequency of keywords in the published articles*

observed in each division and their respective frequencies.

Concerning Social Sciences, as shown in Table 1C, the predominant keywords involve communication, *sociolinguistics*, and *multilingualism*. This result implies that Linguistics is multidisciplinary and interdisciplinary by nature. This also demonstrates the collaboration between the faculty of Linguistics and Communication sections and the fields of specialization of the Linguistics faculty, which also involve Communication. Collaboration with other researchers has a positive impact on scientific publications (Smedy & Try, 2005). Hence, these three predominant keywords have already been explored by the faculty.

Table 1D shows that keywords in Literature were only rarely manifested in the published articles. This suggests that most of the Linguistics faculty only explored topics and issues in Linguistics. Seldom did they explore topics in Literature unless they collaborated with the faculty in Literature.

3.3. Journals of the Faculty Published Articles

Table 3 illustrates that local coverage has the highest number of publications (46), followed by international (15) and national (6) journals. Most research papers were published in PAGE VII Publication (i.e., Multidisciplinary), which is, according to Dr. Floriza Laplap, a local journal (F. Laplap, personal communication, November 22, 2018). This high number of local publications is in contrast with the findings, which revealed that local scientists prefer to submit their papers to higher-impact journals outside the country (Tecson-Mendoza, 2015). Consequently, the National Academy of Science and Technology Philippines (NAST PHL) continuously encourages researchers to publish their high-quality papers in local journals particularly those listed in Thomson Reuter and or Scopus master journal lists which are ideal for reaching wider readership and achieving a high citation or impact factor (Tecson-Mendoza, 2015).

Consequently, due to the administration's mandate of strengthening the research and publication area of

Table 1B

Summary of Clustered Keywords in DDC

DDC Divisions	F
Languages (400)	22
Social Sciences (300)	17
Literature (800)	12
Generalities (000)	4

Table 1C

Keywords: Social Sciences (300)

Keywords	f	DDC
Communication	13	302.2
Sociolinguistics	9	306.44
Multilingualism	7	306.44
Education	5	370
Child/Children	3	305.23
Oral/Oral Communication	3	302.2242
Politeness	3	395
Teachers/Teaching	3	371.1
Television	3	302.23
College graduates	2	370.15
Interaction	2	378
Mass sermons	2	302.2
Metalinguistic	2	302
Parent	2	306.874
Radio	2	306.874
Second language acquisition	2	302
Taboo, Linguistic	2	302.23

Table 1D*Keywords: Literature (800)*

Keywords	F	DDC
Cebu	1	899.2113
Cohesive devices	1	808
Conversation	1	808.56
Criticism, textual	1	801
Electronic mail messages - Terminology	1	808
Essays	1	808.4
Public speaking	1	808.51
Rhetoric	1	808
Romantic movies	1	808.56
Theses proposals	1	808.02
Turn-taking	1	808
Verbal behavior	1	808

Table 2*Journal Publications**N = 67*

Journal Titles	Coverage	f
USC Graduate Journal	Local	23
PAGE VII Publication	Local	23
- PAGE VII Multidisciplinary Journal	Local	9
- PAGE VII Research Journal	Local	8
- PAGE VII Journal	Local	6
Philippine Quarterly of Culture and Society	National	6
International Journal of Education, Culture, and Society	International	2
Asia Pacific Journal of Education, Arts, and Sciences	International	2
Philippine Journal of Linguistics	International	2
Scholars Journal of Arts, Humanities, and Social Sciences	International	1
International Journal of Linguistics and Education	International	1
Asia Pacific Journal of Multidisciplinary Research	International	1
IAFOR Journal of Language Learning	International	1
Online Journal of Communication and Media Technologies	International	1
International Journal of Language and Linguistics	International	1
International Journal of Information and Communication Sciences	International	1
Journal of English and Applied Linguistics	International	1
Kajian Linguistik dan Sastra Journal	International	1
Total No. of Journals		67

the university, several faculty researchers have started to venture into peer-refereed international publications where the discipline on applied linguistics is more welcomed. The Office of Research previously gave incentives to faculty researchers for manuscripts published in a non-predatory journal. Such incentives aimed to encourage and challenge faculty to conduct research and publish.

3.4. Master of Arts in Applied Linguistics Courses that can use the Faculty Published Articles

Table 3 reveals that most faculty published

journal articles are useful to discourse analysis (22), psycholinguistics (16), and semantics and pragmatics in intercultural communication (10). These findings support the study that the explored research topics and disciplines applied by the masters' theses writers in Applied Linguistics centered on discourse analysis, pragmatics, second language acquisition, and bilingualism (Magno et al., 2018). Discourse analysis is essentially multidisciplinary since it involves linguistics, poetics, semiotics, psychology, sociology, anthropology, history, and Communication research (F. Laplap, personal communication, November 22, 2018). On the contrary, the newly-added courses in

Table 3

MAAL Courses that can use the Faculty Published Articles
N=67

MAAL Courses	*f
Discourse Analysis	22
Psycholinguistics & Multilingualism (with FLA & SLA)	16
Semantics & Pragmatics in Intercultural Communication	10
Recent Issues and Trends in Curriculum & Instructional Material Design	8
Sociolinguistics	8
Grammatical Theories (with Morphology & Syntax)	3
Philippine Languages	3
Translation Studies	3
Phonology & Phonetics	2
ICT & Corpus Linguistics	2
TESOL with Practice Teaching	0
Language Assessment and Evaluation (with TOEFL & IELTS)	0
Quantitative Research Methods in Linguistics	0
Qualitative Research Methods in Linguistics	0
Leadership and Educational Management	0
Stylistics	0
Other Courses not included in MAAL Prospectus	
Cebuano (Language)	6
Communication-Media and Advertisement (Radio, Television)	3

**multiple responses: frequency of published articles*

the Master of Arts in Applied Linguistics during the revisit in 2018 Transition Semester such as TESOL with Practice Teaching, Language Assessment and Evaluation (with TOEFL & IELTS), Quantitative Research Methods in Linguistics, Qualitative Research Methods in Linguistics, Leadership and Educational Management, Cebuano language and Communication-Media and Advertisement and Stylistics were not yet explored. This result implies that these are the research topics for research opportunities. Applied Linguistics is a field drawing from multiple disciplines such as computational linguistics, teacher education, psychology, sociology, and neuroscience (Brown, 2015).

CONCLUSIONS AND RECOMMENDATIONS

This study attempted to provide an index of the publications of the USC Linguistics Faculty from 2006 to 2017 through documentary analysis. Results revealed that the predominant keywords include English, communication, and Cebuano, which fall under the category of languages. In addition, most publications were evident in the local journals, especially the USC Graduate Journal.

Based on the findings of the study, these are the following conclusions: First, the predominance of keywords could be attributed to the research interests, collaboration with fellow faculty with a different specialization, and co-authorship with thesis advisees. Likewise, publications fall under the Languages (400) classification, which align with the faculty's expertise.

Second, publications in international scholarly

journals currently paled in comparison with local and national journals; however, faculty researchers have already started to explore specific international journals aligned with their discipline (i.e., linguistics, communications, language learning). Third, Discourse Analysis, Psycholinguistics, and Pragmatics are already overworked research topics.

Based on the conclusions, these are the following recommendations: First, the library system and the Office of the Vice President or Office of Research could create an index of the USC Faculty Publications and make the reproduced copies of these publications more accessible in the library (hard copies) and website, including Infogateways. Second, faculty researchers and students could choose the following courses as their bases in conceptualizing possible research topics in Linguistics: Grammatical Theories with Morphology & Syntax, Philippine Languages, Translation Studies, Phonology & Phonetics, ICT & Corpus Linguistics, TESOL with Practice Teaching, Language Assessment and Evaluation, Qualitative and Quantitative Research Methods in Linguistics, Leadership, and Educational Management, and Stylistics. Third, faculty researchers should continue to submit their research outputs in international publications to upgrade the faculty profile and university status, while the Office of Research could also come up with a list of non-predatory journals in various fields that can be referred to.

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