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FOREWORD

The Eulogio “Amang” Rodriguez Institute of Science and Technology takes pride in publishing Volume XX, No. 27, January – June 2020 of the EARIST Research Journal as it contributes to the attainment of EARIST’s Mission, Vision, Goals, and Objectives through scholarly publications.

This volume is the output of researches conducted by EARIST faculty during the Academic Year 2020. This volume highlighted Twenty Five (25) distinct researches in different fields, but most noteworthy, each individual research achievement.

The topics vary as shown in every page, but each is full of diverse stories confirming happenings in every college of the Institute. The office of research hopes to mirror the activities of our educators in assuming their task as researchers.

There are more challenges left in the various fields waiting for further scrutiny. We continue the never ending cycle of the quest for new knowledge and further understanding of the issues at hand. The work remains unsolved. But unless we produce our own solutions to existing problems, the challenges will never be met.

The research work undertaken by faculty members and staff are included with the hope that these will contribute to the advancement of research activities of the institute and will serve as medium in the dissemination of research outputs to the community.

Engr. Rogelio T. Mamaradlo
Director, Research Services

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Shirley C. Baesa
Leo Viajar
Christopher Bunag
Crisanto Barizo

INTRODUCTION

Disasters are globally happening, and they just happen, and no one can control when they come. They destroy buildings, houses, rice fields, trees, bridges, highways, the community, and lives.

Our current challenge and responsibility is to reduce risk of disasters, so in the long run we could eventually feel and observe the risk reduction impact. Among these disasters, the ones commonly experienced in the Philippines are as follows: a) flooding, b) earthquake, c) volcanic eruption, d) tsunami. Ground shaking from earthquake can collapse buildings and bridges, disrupt gas, electric, and sometimes trigger landslide. Volcanic eruptions can be accompanied by other natural hazards like earthquakes, mudflows, flash floods, rock falls, landslide, and wild fires. Tsunamis are ocean waves produced by earthquakes or underwater landslide, volcanic eruptions and movement of the ocean floor. Flooding occurs in known flood prone areas when prolonged rainfall over several days, and intense rainfall over a short period of time. The researcher prepared questionnaires that will serve as a guideline to reduce disaster risk.

The aforementioned disasters have harmful ramifications that are evident in developed countries, more so in underdeveloped ones. As already mentioned, observed, and experienced before, when disaster strikes, how can we control the effects of disasters to our community. To solve this question, the researcher conducted this study. Through this, the researcher will be able to narrow down the appropriate methods to be used during disasters.

METHODS

The study used the descriptive research design to determine the respondents'' level of agreement on problems of the study, and answers to the problems which may adversely affect disaster risk reduction to the community. Five (5) survey questionnaires were designed and formulated to determine the common disasters experienced in the country (Philippines). The respondents' experience in disaster was a great help in answering the questionnaire.

Purposive and random samplings were used in this study with 200 respondents from 192 PE students and PE faculty respondents. These are divided by College with 24 respondents each and 8. Faculty to PE department with a total of 200 respondents. Please see the lower Table for the 200 respondents' distribution.

In the questionnaire, the Likert Scale was used with '5' as the highest value and '1' as the lowest value to indicate respondent's view on the disasters and measures for risk reduction.

SUMMARY OF FINDINGS

1. On the profile of the 200 respondents with regards to students, there were a total of 192 student respondents. 107 were in the first year level, 57 in the second year, 14 in the third year, 8 in the fourth year, and 6 were in the fifth year. Of these 192 student respondents, 38 were from engineering, 32 from education, 33 from business, 31 from CIPAC, 30 from CAS, and 28 from CIT, with a total of 192 student respondents. On the faculty appointment, there were 4 faculty members as regulars, 2 as temporary, and 2 as part-timers. On educational qualification, 6 have masteral units, 2 have doctoral units, and no doctoral graduate. With regards to length of service in teaching profession, 2 faculty members have a service record of under 10 years, 4 with 11-20 years, and 2 with 21-30 years. A total of 8 faculty members. There were 5 males and 3 females whose age were distributed as follows: 2 are 31-40 years old, 4 are 41-50 years old, 1 within 50-60 years old, and 1 is 61 years and above. A total of 8 faculty members. In total, 192 PE students and 8 faculty members, there were 200 respondents.

2. On the identified disasters in the Philippines, all of the four identified disasters used in study and also considered deadly, got a computed weighted mean of 5.00 (WM), interpreted as strongly agree.

3. On measures of Disaster Risk Reduction:

a. Flooding risk reduction has the following measures:

i. Develop a flood disaster kit evacuation plan
ii. Discuss evacuation plan and disaster kit with family.
iii. If it has been steadily raining hard for several hours and days, be alert to the possibility of flood.
iv. If you are stopping of your vehicle, camp or park way from streams.
v. When in or alone, stream channel be aware of distant events, such as damns, breaks that may cause flash floods in the area.
vi. Everyone in a watch area should be ready to respond and act quickly.
vii. Be alert to signs of flooding if in a flood-prone area, be ready to evacuate at moments of notice.
viii. Follow the instructions of and advice of local authority.
ix. Listen continuously to a portable battery-powered radio or TV for updated emergency information.
x. Listen continuously to portable battery-powered radio or TV for updated emergency information.
xi. Be alert to signs of flooding. A warning means a flood is already a prone area.
xii. You are at risk, evacuate immediately, move quickly to higher ground, save yourself not your belongings.
xiii. Follow the instruction and advice of local authorities.
xiv. Follow recommended evacuation routes.
xv. Seek necessary medical care at the nearest hospital or medical clinic.
xvi. Help a neighbor who may require special assistance (infants, elderly, and with disabilities).
xvii. Avoid disaster areas
xviii. Listen continuously to a portable battery powered radio/TV for updated emergency information.

b. Earthquake risk reduction has the following measures:

i. Find in advance safe places in each room of your house.
ii. Practice drop, cover, and hold-on in a safe place.
iii. Practice drop, cover, and hold-on at least twice a year
iv. Talk to your insurance agent for financial help and protection.
v. Discuss earthquake, your family, together with you “Disaster Kit” and evacuation plan.
vi. Drop, cover, and hold-on
vii. If you are outdoors find a clear spot away from
viii. If you are in a vehicle pull over to a clear location stop and stay there with your seatbelt fastened until the shocking has stopped.
ix. Stay indoors until the shocking has stopped.
x. Stay away from windows.
xi. Check yourself for injuries?
xii. Protection yourself from further danger by putting or using long pants, a long sleeved shirt shoes and work gloves.
xiii. After you have taken care of yourself, help other trapped persons.
xiv. Inspect your home for damages. Get everyone out of if your home is unsafe.
xv. Look for a fire extinguisher and eliminate fire hazards.

c. Tsunami risk reduction has the following measures:

i. Develop a family disaster plan
ii. If you are visiting an area at risk from Tsunami and there is already warning, return back and go to a much higher ground or an evacuation center.
iii. Learn about Tsunami risk in the community area.
iv. Check your tsunami supplies kit.
v. Locate family members and review evacuation centers.
vi. If you have special evacuation needs (small children, elderly, and with persons with disability) consider early evacuation.
vii. Be ready to evacuate and don’t forget your disaster kit.
viii. If time permits secure unanchored objects around your home or business.
ix. Follow advice and instructions by local authorities.
x. If you are in a tsunami risk prone area, do the following: if you hear an official Tsunami warning or detect signs of a Tsunami, Evacuate at once.
xi. Take Disaster supplies kit
xii. Get to high ground as far inland as possible
xiii. Help injured or trapped personas
xiv. Help neighbors who may require special assistance
xv. Use the telephone only for emergency calls.
xvi. Stay out of the building if waters remain around it.

d. Volcanic eruption risk reduction has the following measures:

i. Learning about community warning system and emergency
ii. Talk to your insurance agent for your financial help and protection
iii. Discuss to your family, volcanic eruption and prepare an action plan.
iv. Be prepared for the hazards brought by volcanic eruption.

v. Follow the evacuation order issued by authorities and put into action your disaster risk plan to reduce risk.
vi. Avoid areas down-wind and river valley, downstream of the volcano.
vii. Stay out of the area defined as restricted area by the government.
viii. Listen to a portable batter operated radio/TV, for updated news and information.
ix. Wear long-sleeved shirts and long pants.
x. Use goggles to protect your eyes.
xi. Wear eye glasses instead of contact lenses.
xii. Use a dust mask or face mask for your breathing.
xiii. Keep vehicle engine off.
xiv. Help a neighbor who may require special assistance.
xv. If possible stay away from volcanic ash fall area.
xvi. When outside, protect yourself from the fine, glossy particles of volcanic ash.
xvii. Clear roofs of ash fall.
xviii. Avoid driving in heavy ash fall.

CONCLUSION AND RECOMMENDATIONS

1. Since the legislation policies of the Philippines were not known in the community, the government should make an educational campaign and action plan for it to develop, power knowledge, and risk awareness.

2. Since some synergies between international agreement and different policies and commitments of the Philippines in various sectors were also not known to the community. There is a strong need of educational campaign to develop power knowledge and risk awareness.

3. Since this risk reduction program is yet to be known in the community. There is a need for both DepEd and CHED to integrate the findings of this study to the PE curriculum.

4. Since the geographical location of the Philippines, is exposed to a plethora of hazards, including typhoons, earthquakes, and 53 active volcanoes, there is a huge need to fully support in terms of effective organization from national, provincial, municipal, barangay with good financial support and incentives.

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DESIGN OF MODULAR INTERNET OF THINGS (IOT) TRAINING KIT SUITABLE FOR INDUSTRIAL REVOLUTION 4.0

Engr. Ronald B. Baral

INTRODUCTIONS

Internet of Things (IoT) is one of the driving forces for Industry 4.0 as emphasized by Charles Towers-Clarkas posted in forbes.com_Feb 20, 2019. It can be understood as the ubiquitous and global network that helps and provides the functionality of integrating the physical world. This is done through the collection, processing and analysis of data generated by IoT sensors, which will be present in all things and will be integrated through the public communication network.

According to International Data Corporation (IDC) recent forecast (June 1, 2019), the number of devices connected to the Internet, including the machines, sensors, and cameras that make up the Internet of Things (IoT), continues to grow at a steady pace. The said forecast estimates that there will be 41.6 billion connected IoT devices, or "things," generating 79.4 zettabytes (ZB) of data in 2025. In addition, Worldwide spending on the Internet of Things (IoT) is forecast to reach $745 billion in 2019, an increase of 15.4% over the $646 billion spent in 2018, according to a new update to the International Data Corporation (IDC) Worldwide Semiannual Internet of Things Spending Guide. IDC expects worldwide IoT spending will maintain a double-digit annual growth rate throughout the 2017-2022 forecast periods and surpass the $1 trillion mark in 2022.

According to Carrie MacGillivray, vice president, Internet of Things and Mobility at IDC. "Adoption of IoT is happening across industries, in governments, and in consumers' daily lives. We are increasingly observing how data generated by connected devices is helping businesses run more efficiently, gain insight into business processes, and make real-time decisions. For consumers, access to data is changing how they are informed about the status of households, vehicles, and family members as well as their own health and fitness," (January 3, 2019).

As the Internet of Things (IoT) market continues to grow, so does the IoT job market demand for highly skilled engineers and other technical professionals that can develop and support the billions of devices predicted by 2025.

Unfortunately, however, Immersat Research Programme research shows that a skills gap has emerged as one of the key barriers to successful Industrial Internet of Things (IIoT) deployment. A lack of in-house skills was cited as the top barrier to IIoT deployment, higher than other issues such as cyber-security risks and high costs. The said study shows that 74% of businesses report using external partners to bridge the skills gap and assist with IioT development.

The said skills gap creates challenges and opportunities for our higher education communities to catch up and provides solutions to prepare the next generation of engineers and professionals with the necessary knowledge and capabilities to build these complex systems.

METHODOLOGY

Research Design: Descriptive and developmental design method was utilized in the study

Research Data/Sampling: Purposive Sampling Method

Respondents: BSECE, BSCpE student and faculty members, and Industry practitioners

Research Instrument: Survey Questionnaire patterned to ISO/IEC 30141:2016(E) IoT Reference Architecture

RESULT AND DISCUSSION

Table 1
Assessment on Functionality

Indicators	Students		Professors		Practitioners		Composite Mean		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
Functional Completeness. Degree to which the set of function covers all the specified tasks and user objectives.	4.75	E	4.30	E	4.40	E	4.48	E	2
Functional Correctness. Degree to which the System provides the correctness of results with the needed degree of precision	4.75	E	4.60	E	4.60	E	4.65	E	1
Functional appropriateness. Degree to which the functions facilitate the accomplishment of specified tasks and objectives	4.60	E	4.50	E	4.40	E	4.50	E	3
Overall Weighted Mean	**4.70**	**E**	**4.47**	**E**	**4.47**	**E**	**4.54**	**E**	

Legend:

Excellent	(E)	4.20 – 5.00
Very Good	(VG)	3.40 – 4.19
Good	(G)	2.60 – 3.39
Fair	(F)	1.80 – 2.59
Poor	(P)	1.00 – 1.79

Table 1 shows the assessment of functionality of the groups of Students, Professors, and Practitioners of the IoT Training Kit, the three groups rated all of the indicators as “Excellent” having overall weighted mean values of 4.70, 4.47, and 4.47 respectively.

They ranked these indicators all with verbal interpretation of “Excellent” as follows: rank 1, “Functional Correctness. Degree to which the System provides the specified tasks and user objectives” with a composite weighted mean of 4.48; and rank 3, “Functional appropriateness. Degree to which the functions facilitate the accomplishment of specified tasks and objectives” with a composite weighted mean of 4.50.

This implies that the IoT Training Kit covers all specified task and user objectives, provides correct results with the needed degree of precision and facilitates the accomplishment of specified tasks and objectives.

Table 2
Assessment of Usability

Indicators	Students		Professors		Practitioners		Composite Mean		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
Operability. Degree to which the system has attributes that make it easy to operate and control.	4.60	E	4.30	E	4.70	E	4.53	E	1
Accessibility. Degree to which the system can be used by people with widest range of characteristics and capabilities to achieve a specified context of use.	4.65	E	4.40	E	4.20	E	4.42	E	3
User interface aesthetics. Degree to which a user interface enables pleasing and satisfying interaction for the user.	4.50	E	4.40	E	4.50	E	4.47	E	2
Overall Weighted Mean	**4.58**	**E**	**4.37**	**E**	**4.47**	**E**	**4.47**	**E**	

Table 2 illustrates the group of Students, Professors, and Practitioners assessment of usability, they rated all of the indicators as “Excellent” having overall weighted mean values of 4.58, 4.37, and 4.47 respectively.

They ranked these indicators as follows: rank 1, “Operability. Degree to which the system has attributes that make it easy to operate and control.” with a composite weighted mean of 4.53; rank 2, “User interface aesthetics. Degree to which a user interface enables pleasing and satisfying interaction for the user.” with a composite weighted mean of 4.47; and rank 3, “Accessibility. Degree to which the system can be used by people with widest range of characteristics and capabilities to achieve a specified context of use.” with a composite weighted mean of 4.42.

This implies that the IoT Training Kit in terms of usability covers all the specified task and user objectives in terms of operability in which the system attributes to make it easier to operate and control and its accessibility in which the system can be used by people with the widest range of characteristics and capability to achieve a specified context of use.

Table 3
Assessment of Reliability

Indicators	Students		Professors		Practitioners		Composite Mean		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
Maturity. Degree to which the system meets needs for reliability under normal operation.	4.75	E	4.50	E	3.70	VG	4.32	E	3
Availability. Degree to which the system is operational and accessible when required for use	4.60	E	4.80	E	4.40	E	4.60	E	1
Fault Tolerance. Degree to which a system, product or component operates as intended despite the presence of hardware or software faults.	4.60	E	4.40	E	4.50	E	4.50	E	2
Overall Weighted Mean	**4.65**	**E**	**4.57**	**E**	**4.20**	**E**	**4.47**	**E**	

Shown on Table 3 is the group of Students, Professors, and Practitioners on their assessment of reliability, rated most of the indicators as “Excellent” having overall weighted mean values of 4.65, 4.57, and 4.20 respectively.

They ranked these indicators as follows: rank 1, “Availability. Degree to which the system is operational and accessible when required for use” with a composite weighted mean of 4.60; rank 2, “Fault Tolerance. Degree to which a system, product or component operates as intended despite the presence of hardware or software faults” with a composite weighted mean of 4.50; and rank 3, “Maturity. Degree to which the system meets needs for reliability under normal operation” with a composite weighted mean of 4.32.

This implies that the reliability IoT Training Kit meets the needs for reliability under normal operation and that the system is operational and accessible when required to be used, is fault tolerant.

Table 4
Assessment of Efficiency

Indicators	Students		Professors		Practitioners		Composite Mean		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
Time Behavior. Degree to which the response and processing time and throughout rates of system, when performing its functions, meet requirements.	4.60	E	4.20	E	4.50	E	4.43	E	3
Resource utilization. Degree to which the amount and types of resources used by the system, when performing its functions, meet requirements.	4.75	E	4.30	E	4.50	E	4.52	E	1
Capacity. Degree to which the maximum limits of the system parameter meets requirements.	4.70	E	4.50	E	4.30	E	4.50	E	2
Overall Weighted Mean	**4.68**	**E**	**4.33**	**E**	**4.43**	**E**	**4.48**	**E**	

The Students, Professors, and Practitioners on their assessment of efficiency shown on Table 4, rated all of the indicators as “Excellent” having overall weighted mean values of 4.68, 4.33, and 4.43 respectively.

They ranked these indicators as follows: rank 1, “Resource utilization. Degree to which the amount and types of resources used by the system, when performing its functions, meet requirements” with a composite weighted mean of 4.52; rank 2, “Capacity. Degree to which the maximum limits of the system parameter meets requirements” with a composite weighted mean of 4.50; and rank 3, “Time Behavior. Degree to which the response and processing time and throughout rates of system, when performing its functions, meet requirements” with a composite weighted mean of 4.43.

It is understood that the efficiency of the IoT Training Kit covers all the specified task and user objectives with an efficient response and processing rates when performing its functions, meets the requirements with its efficient resource utilization when performing its functions and its efficiency of its capacity to meet the requirements to the maximum limits.

Table 5
Assessment of Maintainability

Indicators	Students		Professors		Practitioners		Composite Mean		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
Modularity. Degree to which the system is composed of discrete components such that a change to one component has minimal impact on other components.	4.50	E	4.60	E	4.60	E	4.57	E	3
Reusability. Degree to which an asset can be used in more than one system, or in building other assets.	4.60	E	4.60	E	4.60	E	4.60	E	2
Modifiability. Degree to which the system can be effectively and efficiency modified without introducing defects or degrading existing system quality.	4.65	E	4.30	E	5.00	E	4.65	E	1
Overall Weighted Mean	**4.58**	**E**	**4.50**	**E**	**4.73**	**E**	**4.61**	**E**	

The Students, Professors, and Practitioners on their assessment of maintainability displayed on Table 5, rated all of the indicators as “Excellent” having overall weighted mean values of 4.58, 4.50, and 4.73 respectively.

They ranked these indicators as follows: rank 1, “Modifiability. Degree to which the system can be effectively and efficiency modified without introducing defects or degrading existing system quality” with a composite weighted mean of 4.65; rank 2, “Reusability. Degree to which an asset can be used in more than one system, or in building other assets” with a composite weighted mean of 4.60; and rank 3, “Modularity. Degree to which the system is composed of discrete components such that a change to one component has minimal impact on other components” with a composite weighted mean of 4.57.

It is inferred that the maintainability of the IoT Training Kit covers all the specified task and user objectives in terms of its modularity in which the system is composed of discrete components such that changes to one component impacts minimal components, its reusability to which an asset can be used in more than one system, or in building other assets, and its modifiability to which the system is effectively and efficiency modified without introducing defects or degrading existing system quality.

CONCLUSIONS

Based on the findings of the study, the following conclusions are hereby drawn:

1. The IoT Training Kit in terms functionality accomplishes all specified tasks and user objectives with the needed degree of precision.

2. The IoT Training Kit in terms of usability has attributes that make it easy to operate and control while enabling pleasing and satisfying interaction for the user with wide range of characteristics and capabilities to achieve specified context of use.

3. The IoT Training Kit meets the needs for reliability under normal operation and that the system is functioning and accessible when required to be used and with a degree of tolerance to faults.

4. The IoT Training Kit has excellent processing time using the maximum limits of the system, and resources when performing functions to meet requirements making it efficient.

5. The IoT Training Kit is modifiable, achieves modularity, and is reusable.

RECOMMENDATIONS

Develop an Outcome Based Laboratory Manual for the Internet of Things (IoT) Training Kit.

TIME SERIES ANALYSIS OF THE CONSUMER PRICE INDEX IN THE PHILIPPINES

Jefferson A. Costales

INTRODUCTION AND BACKGROUND OF THE STUDY

Every individual is observing the behavior of the prices in the market. These processes can help the individual to have a strategy in decision making for budgeting the everyday expenses. One of the indicators to determine the prices of the commodity in the markets is called the Consumer Price Index (CPI). According to the Philippine Statistical Authority-formerly National Statistics Office (PSA), CPI is an indicator of the change in the average retail prices of a fixed basket of goods and services commonly purchased by households relative to a base year. Base on the website from macro basics, this basket was composed of several goods and services measured at different weights that will determine the overall price level. These weights are assigned in every goods and services based upon the consumption priorities of households and also on the way they allot their resources or income to meet their needs. CPI is a major statistical series used for economic analysis and as a monitoring indicator of government economic policy. Moreover, CPI is most widely used in the calculation of the inflation rate and purchasing power of the peso.

Based on the study of Zhang, et.al, 2013, box-Jenkins technique is one of the main tools they used in forecasting the Consumer Price Index of China. They reflect to their study that the suitable model should meet the following conditions: concise, coefficient shows to be stable; there is no residual autocorrelation, relatively good out-of sample forecast and so on. In addition, they found out that the ARMA model that was formed is valid and has relatively high forecast accuracy.

Yudie Du (et. al, 2014) proposed a novel divide-and-conquer model for predicting consumer price index. They used three models namely propagation neural network (PNN) model, grey forecasting model GM (1,1) and ARIMA model. In the result, they conclude that dividing-integration method enhances the accuracy of predicting consumer price index. In the analysis, they transform the forecasting of the national CPI to the forecasting of the 8 sub-CPI and obtain the best forecasted results. Hence, they suggest that using SARIMA model should also be taken into consideration for enhancing the accuracy of prediction.

STATEMENT OF THE PROBLEM

Using time series analysis, this study aims to develop a best model that can predict the monthly Consumer Price Index in the Philippines. Specifically, this research seeks to answer the following questions:

1. What is the behavior of the monthly CPI of the Philippines?

2. What are the candidates' models that can predict the monthly CPI in the Philippines?

3. What is the best model that can predict the monthly CPI in the Philippines?

METHOD OF RESEARCH USED

Time series analysis accounts for the fact that data points taken over time may have an internal structure (such as autocorrelation, trend or seasonal variation) that should be accounted for. Time series analysis comprises methods for analyzing time series data in order to extract meaningful statistics and other characteristics of the data. Time series forecasting is the use of a model to predict future values based on previously observed values. While regression analysis is often employed in such a way as to test theories that the current values of one or more independent time series affect the current value of another time series, this type of analysis of time series is not called "time series analysis", which focuses on comparing values of a single time series or multiple dependent time series at different points in time (Imdadullah, 2014).

THE DATA

The researchers utilized the data coming from the website of Philippine Statistics Authority from January 2001 to December 2015. The researchers used the period of January 2007 to December 2013 for the creation of best model and for in sample forecasting then the remaining data was used for validation of best model for accuracy.

STATISTICAL TREATMENT

Box-Jenkins Models

The Box-Jenkins ARMA model is a combination of the AR and MA models $Xt=\delta+\phi 1Xt-1+\phi 2Xt-2+\cdots+\phi pXt-p+At-\theta 1At-1-\theta 2At-2-\cdots-\theta qAt-q$, where the terms in the equation have the same meaning as given for the AR and MA model.

The Box-Jenkins model assumes that the time series is stationary. Box and Jenkins recommend differencing non-stationary series one or more times to achieve stationarity. Doing so produces an ARIMA model, with the "I" standing for "Integrated".

Some formulations transform the series by subtracting the mean of the series from each data point. This yields a series with a mean of zero. Whether you need to do this or not is dependent on the software you use to estimate the model.

Box-Jenkins models can be extended to include seasonal autoregressive and seasonal moving average terms. Although this complicates the notation and mathematics of the model, the underlying concepts for seasonal autoregressive and seasonal moving average terms are similar to the non-seasonal autoregressive and moving average terms.

The most general Box-Jenkins model includes difference operators, autoregressive terms, moving average terms, seasonal difference operators, seasonal autoregressive terms, and seasonal moving average terms. As with modeling in general, however, only necessary terms should be included in the model. Those interested in the mathematical details can consult Box, Jenkins and Reisel (1994), Chatfield (1996), or Brockwell and Davis (2002).

There are three primary stages in building a Box-Jenkins time series model.

- Model Identification
- Model Estimation
- Model Validation

Box-Jenkins Model Identification

- **Stationarity and Seasonality**

The first step in developing a Box-Jenkins model is to determine if the series is stationary and if there is any significant seasonality that needs to be modeled.

- **Detecting stationarity**

Stationarity can be assessed from a run sequence plot. The run sequence plot should show constant location and scale. It can also be detected from an autocorrelation plot. Specifically, non-stationarity is often indicated by an autocorrelation plot with very slow decay.

- **Detecting seasonality**

Seasonality (or periodicity) can usually be assessed from an autocorrelation plot, a seasonal subseries plot, or a spectral plot.

- **Differencing to achieve stationarity**

Box and Jenkins recommend the differencing approach to achieve stationarity. However, fitting a curve and subtracting the fitted values from the original data can also be used in the context of Box-Jenkins models.

- **Seasonal differencing**

At the model identification stage, our goal is to detect seasonality, if it exists, and to identify the order for the seasonal autoregressive and seasonal moving average terms. For many series, the period is known and a single seasonality term is sufficient. For example, for monthly data we would typically include either a seasonal AR 12 term or a seasonal MA 12 term. For Box-Jenkins models, we do not explicitly remove seasonality before fitting the model. Instead, we include the order of the seasonal terms in the model specification to the ARIMA estimation software. However, it may be helpful to apply a seasonal difference to the data and regenerate the autocorrelation and partial autocorrelation plots. This may help in the model identification of the non-seasonal component of the model. In some cases, the seasonal differencing may remove most or all of the seasonality effect.

- **Identify p and q**

Once stationarity and seasonality have been addressed, the next step is to identify the order (i.e., the p and q) of the autoregressive and moving average terms.

- **Autocorrelation and Partial Autocorrelation Plots**

The primary tools for doing this are the autocorrelation plot and the partial autocorrelation plot. The sample autocorrelation plot and the sample partial autocorrelation plot are compared to the theoretical behavior of these plots when the order is known.

- **Order of Autoregressive Process (p)**

Specifically, for an AR(1) process, the sample autocorrelation function should have an exponentially decreasing appearance. However, higher-order AR processes are often a mixture of exponentially decreasing and damped sinusoidal components.

For higher-order autoregressive processes, the sample autocorrelation needs to be supplemented with a partial autocorrelation plot. The partial autocorrelation of an AR(p) process becomes zero at lag p+1 and greater, so we examine the sample partial autocorrelation function to see if there is evidence of a departure from zero. This is usually determined by placing a 95 % confidence interval on the sample partial autocorrelation plot (most software programs that generate sample autocorrelation plots will also plot this confidence interval). If the software program does not generate the confidence band, it is approximately ± 2$\sqrt{N}$ with N denoting the sample size.

- **Order of Moving Average Process (q)**

The autocorrelation function of a MA(q) process becomes zero at lag q+1 and greater, so we examine the sample autocorrelation function to see where it essentially becomes zero. We do this by placing the 95 % confidence interval for the sample autocorrelation function on the sample autocorrelation plot. Most software that can generate the autocorrelation plot can also generate this confidence interval.

The sample partial autocorrelation function is generally not helpful for identifying the order of the moving average process.

- **Shape of Autocorrelation Function**

The following table summarizes how we use the sample autocorrelation function for model identification.

SHAPE	INDICATED MODEL
Exponential, decaying to zero	Autoregressive model. Use the partial autocorrelation plot to identify the order of the autoregressive model.
Alternating positive and negative, decaying to zero	Autoregressive model. Use the partial autocorrelation plot to help identify the order.
One or more spikes, rest are essentially zero	Moving average model, order identified by where plot becomes zero
Decay, starting after a few lags	Mixed autoregressive and moving average model.
All zero or close to zero	Data is essentially random.
High values at fixed intervals	Include seasonal autoregressive term.
No decay to zero	Series is not stationary.

- **Mixed Models Difficult to Identify**

In practice, the sample autocorrelation and partial autocorrelation functions are random variables and will not give the same picture as the theoretical functions. This makes the model identification more difficult. In particular, mixed models can be particularly difficult to identify.

Although experience is helpful, developing good models using these sample plots can involve much trial and error. For this reason, in recent years information-based criteria such as FPE (Final Prediction Error) and AIC (Akaike Information Criterion) and others have been preferred and used. These techniques can help automate the model identification process. These techniques require computer software to use. Fortunately, these techniques are available in many commerical statistical software programs that provide ARIMA modeling capabilities.

For additional information on these techniques, see Brockwell and Davis (1987, 2002).

Box-Jenkins Model Estimation

- **Use Software**

Estimating the parameters for the Box-Jenkins models is a quite complicated non-linear estimation problem. For this reason, the parameter estimation should be left to a high quality software program that fits Box-Jenkins models. Fortunately, many commercial statistical software programs now fit Box-Jenkins models.

- **Approaches**

The main approaches to fitting Box-Jenkins models are non-linear least squares and maximum likelihood estimation.
Maximum likelihood estimation is generally the preferred technique. The likelihood equations for the full Box-Jenkins model are complicated and are not included here. See (Brockwell and Davis, 1991) for the mathematical details.

Box-Jenkins Model Diagnostics

- **Assumptions for a Stable Univariate Process**

Model diagnostics for Box-Jenkins models is similar to model validation for non-linear least squares fitting.

That is, the error term At is assumed to follow the assumptions for a stationary univariate process. The residuals should be white noise (or independent when their distributions are normal) drawings from a fixed distribution with a constant mean and variance. If the Box-Jenkins model is a good model for the data, the residuals should satisfy these assumptions.

If these assumptions are not satisfied, we need to fit a more appropriate model. That is, we go back to the model identification step and try to develop a better model. Hopefully the analysis of the residuals can provide some clues as to a more appropriate model.

- **4-Plot of Residuals**

As discussed in the EDA chapter, one way to assess if the residuals from the Box-Jenkins model follow the assumptions is to generate a 4-plot of the residuals and an autocorrelation plot of the residuals. One could also look at the value of the Box-Ljung (1978) statistic.

RESULTS AND DISCUSSION

This chapter presents the results of summary of data and statistical analysis. The discussion covers the following: 1.) Exploratory data analysis or identifying the behavior of the monthly CPI in the Philippines 2.) to determine the candidates model that can predict the monthly CPI in the Philippines 3.) to determine the best model that can predict the monthly CPI in the Philippines.

Exploratory Data Analysis

Figure 1 shows the descriptive statistics of the monthly CPI in the Philippines from 2001-2015. It is reflects that the series of CPI has an increasing trend with an average of 110.30. The maximum value of CPI is 142.60, the skewness is 0.03, and the kurtosis is 1.61. These results indicated that the series is not normally distributed. Another test to determine the normally distribution of series is the jarque bera test. Based on the p-value of the jarque bera test, it supports the conclusion that the series is not normally distributed because its p-value is less than to assign alpha-0.05. Figure 2 shows the behavior CPI in the Philippines presented monthly every year. It reflects that after the month of June there is a slight shift or increase of CPI up to December every year.

Figure 1. Trend and Distribution of the Monthly CPI in the Philippines, 2001-2015

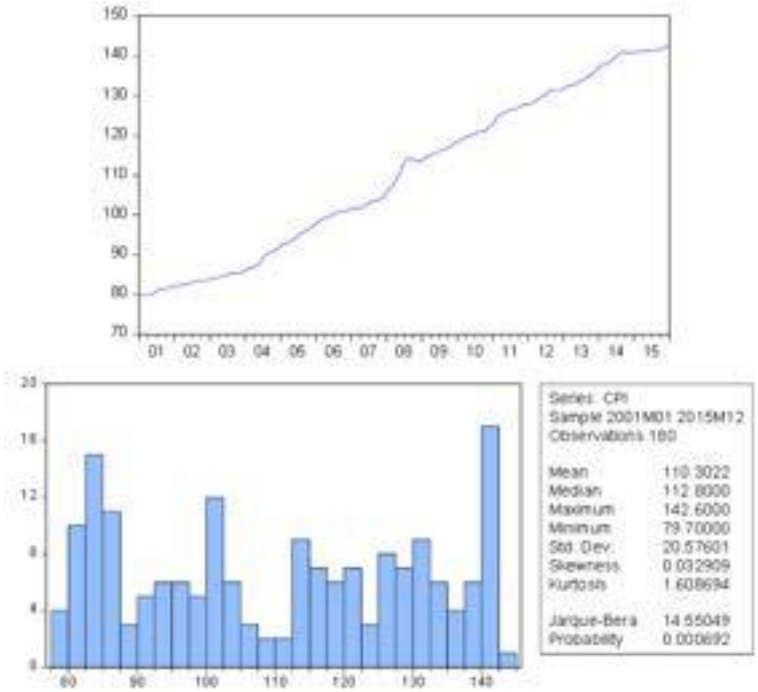
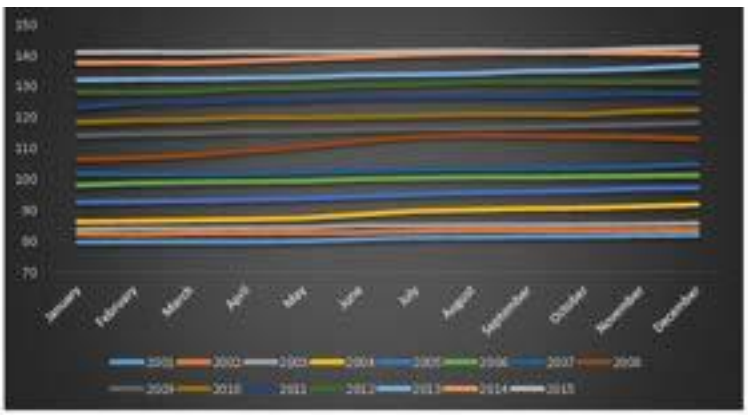


Figure 2: Monthly CPI in the Philippines from 2001 – 2015



Test for Stationarity

Table 1 shows the Augmented Dickey Fuller test to identify whether the series is stationary or not. Base on the computed p-value of ADF test which is equal to 0.9664, there is no sufficient evidence to Reject the Ho. This means that the given data has a unit root or the data is not stationary.

Table 2 shows the transformed data to test unit root test. Base on the computed p-value of ADF test which is equal to 0.0000, there is a sufficient evidence to Reject the Ho. This means that the given data does not have a unit root or the data is stationary.

Table 1
Augmented Dickey-Fuller Unit Root Test of the Monthly CPI in the Philippines Year 2001-2015

Null Hypothesis: CPI has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.118639	0.9664
Test critical values:	1% level	-3.467205	
	5% level	-2.877636	
	10% level	-2.575430	

*MacKinnon (1996) one-sided p-values.

Table 2
Augmented Dickey-Fuller Unit Root Test of the Transformed Monthly CPI in the Philippines Year 2001-2015

Null Hypothesis: DLOG(CPI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.512016	0.0000
Test critical values:	1% level	-3.467205	
	5% level	-2.877636	
	10% level	-2.575430	

*MacKinnon (1996) one-sided p-values.

Model Identification

The researcher used the monthly CPI from 2007 to 2013 as working data file for data analysis. Using the statistical software R, the researchers produce different model base on Akaike Information Criterion (AIC) to determine the best model.

Table 3 shows the model identification from the monthly working data 2007-2013 of CPI in the Philippines. The following series use was transformed into logarithmic for remedial and satisfaction of the assumption of the model. It is found that the best model to forecast the monthly is ARIMA (1,1,0)(1,0,0)[12] with drift.

Table 3
Estimated Model based on the Akaike Information Criterion (AIC)

```
ARIMA(2,1,2)(1,0,1)[12] with drift         : Inf
ARIMA(0,1,0) with drift          : -683.8227
ARIMA(1,1,0)(1,0,0)[12] with drift         : -696.5111
ARIMA(0,1,1)(0,0,1)[12] with drift         : -692.295
ARIMA(0,1,0)                     : -634.3174
ARIMA(1,1,0) with drift          : -695.505
ARIMA(1,1,0)(2,0,0)[12] with drift         : -695.5579
ARIMA(1,1,0)(1,0,1)[12] with drift         : Inf
ARIMA(1,1,0)(2,0,1)[12] with drift         : Inf
ARIMA(0,1,0)(1,0,0)[12] with drift         : -681.921
ARIMA(2,1,0)(1,0,0)[12] with drift         : -695.3922
ARIMA(1,1,1)(1,0,0)[12] with drift         : -695.4719
ARIMA(2,1,1)(1,0,0)[12] with drift         : Inf
ARIMA(1,1,0)(1,0,0)[12]                    : -689.2826

Best model: ARIMA(1,1,0)(1,0,0)[12] with drift
```

Model Estimation

Table 4 shows the model estimation of the best model to identify the significant of its parameter. Based on the computed value of the coefficient for each parameter and its standard error, the absolute quotient value of the AR1 and SAR are 3.6594 and 3.1418, respectively is greater than 3, it means that there is statistical sufficient evidence to say that the parameter is significant.

Table 4
Estimated value of the Parameter of the Best Model

Coefficients:	ar1	sar1	Drift
	0.4007	0.3745	0.4228
s.e.	0.1095	0.1192	0.0872

Model Validation

Residual Diagnostic

Figure 3 shows the residual plot of the best model created. This shows that the variance of the error term are seems to be constant. It also shows that the average of the residual is equal to 0.00523023 which is approximately equal to zero.

Table 5 and figure 4 shows the residual analysis in identifying the independency of error term for Autoregressive Conditional Heteroskedasticity (ARCH). Since the computed p-value Box-Ljung test is equal to 0.9355 which is greater than the assign alpha 5%, there is a statistical sufficient evidence to say that the error term are independent. Moreover, table 6 and figure 5 shows the residual analysis in identifying the independency of error term for Generalized Autoregressive Conditional Heteroskedasticity (GARCH). Based on the computed p-value of the Box-Ljung test is equal to 0.2675 which is also greater than the assign alpha 5%, it means that there is a statistical sufficient evidence to say that the error term are independent.

Figure 3. Residual Plot of the Best Model

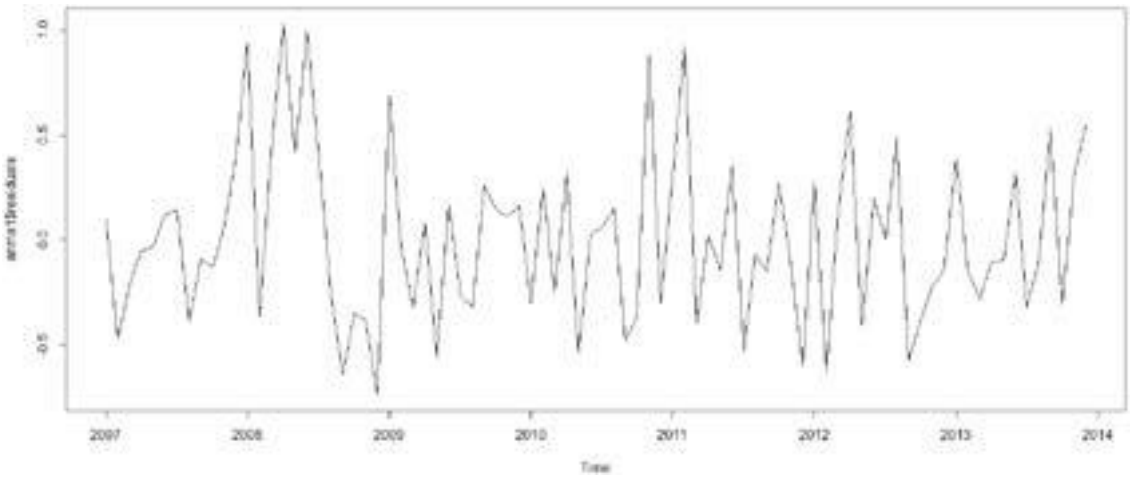


Table 5
Independency of Error Term for Autoregressive Conditional Heteroskedasticity (ARCH) (Formal way)

Box-Ljung test	
X-squared	22.6820

df	20
p-value	0.3047

Figure 4. Independency of Error Term Autoregressive Conditional Heteroskedasticity (ARCH) (Informal way)

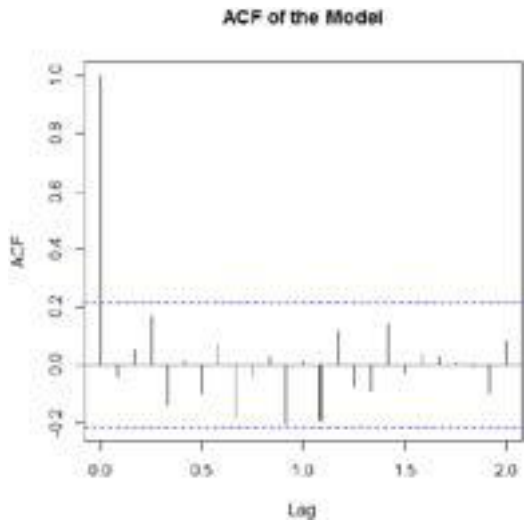


Table 6
Independency of Error Term for Generalized Autoregressive Conditional Heteroskedasticity (GARCH) (Formal way)

Box-Ljung test	
X-squared	26.8340
df	20
p-value	0.1400

Figure 5
Independency of Error Term Generalized Autoregressive Conditional Heteroskedasticity (GARCH) (Informal way)

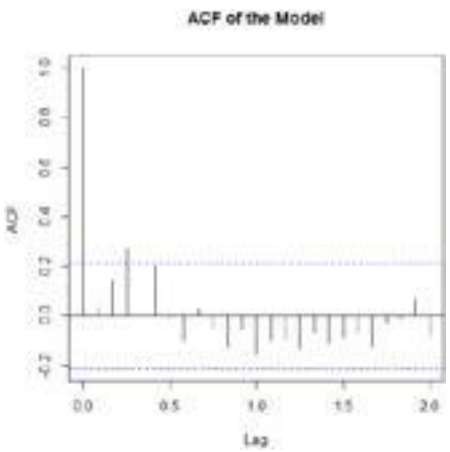


Table 7
Test for Normality of Error Term

Jarque Bera Test	
X-squared	4.1849
df	2
p-value	0.1234

Forecasted Value and Model Accuracy

Figure 6 shows the point forecasts (blue line), 80% high and low forecast (dark gray) and 95% high and low forecast (light gray). It shows that the forecasted value from the created model has an increasing trend from 2014 to 2017 while figure 7 shows the forecasted value with realization of CPI from 2014 to 2016. Figure 7 also shows that the some forecasted value lie in the realization CPI and most of the realization CPI lie in the 80% forecasted variation. Table 8 shows the accuracy of the model for the working and testing data set. Both of two (2) data set found that the Mean Absolute Percent Error (MAPE) are less than 10. This means that the forecasted and realization CPI are almost 2% error.

Figure 6. Forecasted Value from 2014 to 2017

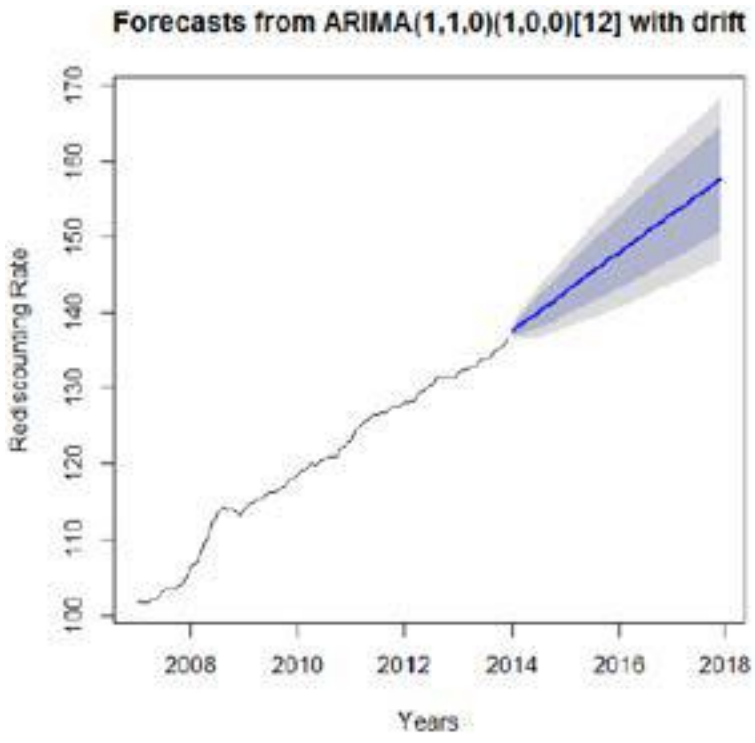


Figure 7. Comparison of Realization to Forecasted Value from 2014 to 2016

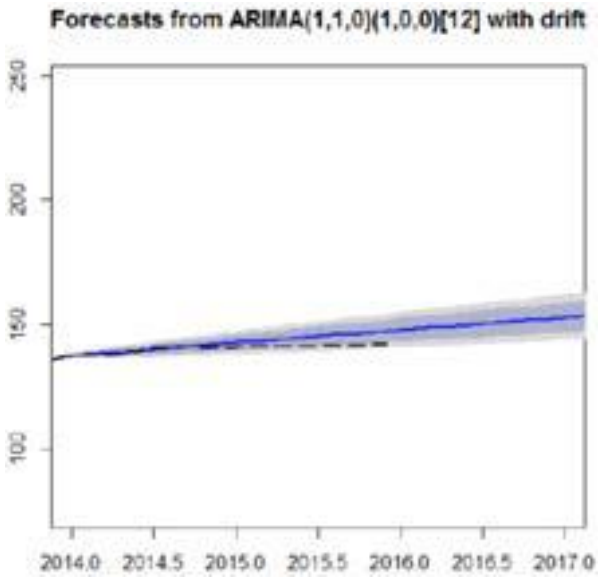


Table 8
Model Accuracy of the Best Model

Data Set	ME	RMSE	MAE	MPE	MAPE	MASE	ACF1	Theil's U
Training	0.00523	0.405468	0.329348	0.005383	0.276033	0.063728	-0.03913	NA
Test	-2.02764	2.751801	2.089112	-1.43368	1.47761	0.404236	0.898221	7.215305

CONCLUSION

The following conclusions are derived from the findings presented:

1. The monthly CPI from 2007 to 2013 shows an increasing trend.

2. It found out that there is a slight shift of CPI after June every year.

3. The best model that can predict the CPI is SARIMA (1,1,0)x (1,0,0)[12] with drift

4. The forecasted value of the created model has an increasing trend. This means that there will be an increase on cost of living, which related to inflation.

5. An increase in CPI means that a household has to spend more pesos to maintain the same standard of living; that's mostly bad for the households, but it can be good for businesses and the government.

6. This is the increase in the price of consumable goods and services as result of the fall in the purchasing power of a currency, which means more money is spent for a fewer goods because the currency has lost some of his value owing to some economy factors.

RECOMMENDATION

Based on the foregoing findings and derived conclusions of the study, the following recommendations are formulated:

1. The government may adjust the prices of the goods and services especially those daily needs like food and transportation.

2. The government may graciously increase the income of an employed individual especially those laborers so that they can maintain a sufficient daily living.

3. The government should strengthen the firmness of peso.

4. The government should involve in technological innovation for producing good quality product in the Philippines to lessen the price.

5. Inflation, as measured by an increase in the CPI, means that the government can sign contracts to pay employees or purchase materials in current dollars and then pay them back in inflated dollars

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E-views Help Topics

THE ROLE OF TECHNOLOGY IN LESSON PLANNING: USING EDUCATIONAL DATA MINING

Melody L. Gabas

INTRODUCTION

This focus on systematic collection and analysis of learner-oriented data is also based in part on the drive to move from more subjective, to experimental based, data-driven research methods. This strategy can lead to more uncompromising, higher-quality evaluation of proposed teaching methods or interventions, as well as help in teasing out the implied factors that contribute to the observed learning outcomes. They analyzed the critical commonalities and differences in the tools and strategies being used to collect and analyze data from student work processes and artifacts, and examined issues and challenges related to reproducing prior studies and results. Their vision for routine data collection as students work on classroom activities goes far beyond providing a solid basis for evaluating classroom research questions. Educational data mining is the process of converting raw data from educational systems to useful information that can be used to inform design decisions and answer research questions. Data mining encompasses a wide range of research techniques that includes more traditional options such as database queries and simple automatic logging as well as more recent developments in machine learning and language technology.

Most of our professor and teachers now are using the technology as one of their tools to communicate easily with the students. For example, some teachers preferred to send the projects thru email for them to access the projects whenever wherever. Though, we cannot assure the security of our files thru the common shared tools like email. This study will try to implement if we can use to study at home at any given time or opportunity with a low-budget so that other people can afford also. But some may not because you may need some hardware like PC to communicate with the program and for the teacher. Base on their study, some of the country already implemented this kind of teaching. I hope we can implement also here in our country to lessen the time and cost but I am hoping also that it should be effective teaching to have interactions with the teacher through home-based study.

This paper reports an implemented, efficient, generic solution to a major emerging problem in educational data mining: efficient exploration of vast student-tutor interaction logs. They identify several useful requirements for a tool to support such exploration. Their key conceptual contribution uses temporal relations to expose natural graded structure. This is the sense in which “time will tell” many basic relationships among tutorial events. Relevant criteria for evaluating this work include implementation cost, efficiency, generality, usability, and utility.

The objective and purpose of this research paper is to review, different clustering algorithms as applied to EDM context.

Using ordinary PCs for the database server and the session browser to explore databases for hundreds of students, thousands of hours of interaction, and millions of words, the operations reported here usually update the display with no traceable lag, though a complex query to find a specified set of events may take several seconds or more.

Higher education institutions are competing for excellence, and in this process, they are utilizing information technologies to gather relevant information for achieving academic excellence. Higher education institutions are competing for excellence, and in this process, they

are utilizing information technologies to gather relevant information for achieving academic excellence.

EDM focuses on analyzing data generated in an educational setup by the various intra-connected or dissimilar systems to develop model for improving learning experience and institutional effectiveness. Various methods have been proposed, applied and tested in data mining field and its argued by some researchers that these generic methods or algorithms are not suitable to be applied to this emerging field of study.

RELATED LITERATURE

1. Educational Data Mining

Problem difficulty estimates play important roles in a wide variety of educational systems, including determining the sequence of problems presented to students and the interpretation of the resulting responses. The accuracy of these metrics is therefore important, as they can determine the relevance of an educational experience. For systems that record large quantities of raw data, these observations can be used to test the predictive accuracy of an existing difficulty metric. In this paper, we examine how well one rigorously developed – but potentially outdated – difficulty scale for American-English spelling fits the data collected from seventeen thousand students using our Spell BEE peer-tutoring system. We then attempt to construct alternate metrics that use collected data to achieve a better fit. The domain-independent techniques presented here are applicable when the matrix of available student-response data is sparsely populated or non-randomly sampled. We find that while the original metric fits the data relatively well, the data driven metrics provide approximately 10% improvement in predictive accuracy. Using these techniques, a difficulty metric can be periodically or continuously recalibrated to ensure the relevance of the educational experience for the student.

EDM converts raw data coming from educational systems into useful information that could potentially have a greater impact on educational research and practice" Traditionally researchers have applied data mining methods like clustering, classification, association rule mining, text mining to educational context as outlined, conducted a survey that provides a comprehensive resource of papers published between 1995 and 2005 on Educational Data Mining (EDM has suggested the application of data mining techniques to study on-line courses. Had suggested association rules and clustering to support collaborative filtering for the development of more sensitive and effective e-learning systems used a case study that uses prediction methods in scientific study to game the interactive learning environment by exploiting the properties of the system rather than learning the system.

2. Learning Analytics and Educational Data Mining in Practice: A Systematic Literature Review of Empirical Evidence

This paper aims to provide the reader with a comprehensive background for understanding current knowledge on Learning Analytics (LA) and Educational Date Mining (EDM) and its impact on adaptive learning. It constitutes on overview of empirical evidence behind key objectives of the potential adoption of LA/EDM in generic educational strategic planning. We examined the literature on experimental case studies conducted in the domain during the past six year (2008-2013). Search terms identified 209 mature pieces of research work, but inclusion criteria limited the key studies to 40. We analyzed the research questions, methodology and findings of these published papers and categorized them accordingly. We used non-statistical methods to evaluate and interpret findings of collected studies. The results

have highlighted four distinct major directions of the LA/EDM empirical research. We discuss on the emerged added value of LA/EDM research and highlight the significance for further implications. Finally we set our thoughts on possible uncharted key questions to investigate both from pedagogical and technical considerations.

3. A Systematic Review on Educational Data Mining

As an interdisciplinary field of study, Educational Data Mining (EDM) applies machine-learning, statistics, Data Mining (DM), psycho-pedagogy, information retrieval, cognitive psychology, and recommender systems methods and techniques to various educational data set so as to resolve educational issues. The International Educational Data Mining Society defines EDM as „„an emerging discipline, concerned with developing methods for exploring the unique types of data that come from educational settings, and using those methods to better understand students, and the settings which they learn in"". EDM is concerned with analyzing data generated in an educational setup using disparate systems. Its aim is to develop models to improve learning experience and institutional effectiveness. While DM, also referred to as Knowledge Discovery in Databases (KDDs), is a known field of study in life sciences and commerce, yet, the application of DM to educational context is limited.

4. Educational Data Mining and Learning Analytics in Programming: Literature Review and Case Studies

Educational data mining and learning analytics promise better understanding of student behavior and knowledge, as well as new information on the tacit factors that contribute to student actions. This knowledge can be used to inform decisions related to course and tool design and pedagogy, and to further engage students and guide those at risk of failure. This working group report provides an overview of the body of knowledge regarding the use of educational data mining and learning analytics focused on the teaching and learning of programming. In a literature survey on mining students" programming processes for 2005–2015, we observe a significant increase in work related to the field. However, the majority of the studies focuses on simplistic metric analysis and is conducted within a single institution and a single.

Understanding why students succeed or fail in computer science courses is a fundamental drive for computer science education research (CSEd), yet, as a research community, we are still struggling to routinely collect data to systematically study and explore this as identified by Lister in 2010 [75]. This is despite initial promising works at the beginning of the century [43, 59, 83, 116]. With the use of online learning systems has come a significant growth in the capture and analysis of student performance data. This focus on systematic collection and analysis of learner-oriented data is also based in part on the drive to move from more subjective, anecdotally-oriented CSEd experiences, to empirically based, data-driven research methods. This strategy can lead to more rigorous, higher-quality evaluation of proposed teaching methods or interventions, as well as help in teasing out the tacit factors that contribute to the observed learning outcomes.

5. Educational Data Mining Workshop

Estimates of student proficiency and problem difficulty play central roles in Item Response Theory (IRT) [11]. Several current educational systems make use of this theory, including our own BEEweb peer-tutoring activities [2,8,9,13]. IRT-based analysis often focuses on estimating student proficiency in the task domain, but the challenge of estimating problem difficulty should not be overlooked. While student proficiency estimates can inform assessment, problem difficulty estimates can be used to refine instruction: these metrics can affect the

selection and ordering of problems posed and can influence the interpretation of the resulting responses [6]. It is therefore important to choose a good difficulty metric initially and to periodically evaluate the accuracy of a chosen metric with respect to available student data. In this paper, we examine how accurately one rigorously developed – but potentially outdated – difficulty scale for the domain of American-English spelling predicts the data collected from students using our SpellBEE system [1]. The defining challenge in providing this assessment lies in the nature of the data. As SpellBEE is a peer-tutoring system, the challenges posed to students are determined by other students, resulting in data that is neither random nor complete. In this work, we rely on a pairwise comparison technique designed to be robust to data with these characteristics. After assessing the relevance of this existing metric (in terms of predictive accuracy), we will examine some related techniques for initially constructing a difficulty metric based on non-random, incomplete samples of observed student data.

IMPORTANCE AND ROLE OF EDUCATIONAL DATA MINING

The EDM process converts raw data coming from educational systems into useful information that could potentially have a greater impact on educational research and practice. The study comes up from traditional educational institutions to web-based learning management system and intelligently adaptive educational hypermedia systems. Although most of the e-learning systems utilized by educational institutions are used to post or access course materials, they do not provide educators with necessary tools that could thoroughly track and evaluate all the activities performed by their learners to evaluate the effectiveness of the course and learning process. Educational data mining uses many techniques such as decision tree, rule induction, neural networks, k-nearest neighbor, naïve Bayesian and many others.

This paper reports an implemented, efficient, generic solution to a major emerging problem in educational data mining: efficient exploration of vast student-tutor interaction logs. We identify several useful requirements for a tool to support such exploration. Our key conceptual contribution uses temporal relations to expose natural hierarchical structure. This is the sense in which “time will tell” many basic relationships among tutorial events.

The success of this approach suggests specific recommendations in designing databases of tutorial interactions: Log each distinct type of tutorial event in its own table. Include student ID, computer, start time, and end time as fields of each such table so as to identify its records as events. Name these fields consistently within and across databases created by successive versions of the tutor so as to make them easier to extract. Adding new tables and fields is fine, but keep the names of the old ones to reuse their display code. Relevant criteria for evaluating this work include implementation cost, efficiency, generality, usability, and utility. Implementation cost was only several person weeks for the tutor-specific prototype and about the same for its generalized interval-based successor.

BENEFITS OF EDUCATIONAL DATA MINING

Data mining has been used to detect and locate the local features in large and huge amount of data to find the private information. Also, data mining reduces the risk in supply chain by analyzing and determining the public data to improve the company performance, and to enhance the usage of supply chain in business. The main objective of higher education institutes is to provide quality education to its students and to improve the quality of managerial decisions.

A data mining brought up with a probability or a chance that a failure can lead into success because data mining requires analyzing, modeling and implementation in order to come up with useful information.

The field of EDM continues to evolve along with the wide variety of data mining techniques designed to inform the educational environments. Ultimately, the objective is to process meaningful information about learning for the purpose of continual educational improvement. When students are the focus, the goal of EDM is to make use of data to present appropriate tasks, learner activities, and resources aimed at optimizing student learning. For example, in real-time, adaptive and intelligent web-based educational systems use estimates of student ability, and incorporate preferences and goals to present the most appropriate learning material. More generally, recommendations can also be made to students about what behaviors might be beneficial (or detrimental) to learning and engagement in general, for example, course sequencing, usage of university services, behaviors online and on social media, etc. When teachers are the focus, the objective is to obtain feedback on the content, delivery, and structure of learning. Such feedback may identify common misinterpretations and irregular patterns of learning and enable teaching staff to refine instructional methods. Examples here might include using feedback to determine optimal instructional sequences to support student learning.

E-learning is related to virtualize distance learning by means of electronic communication mechanisms, using its functionality as a support in the process of teaching-learning. When the learning process becomes computerized, educational data mining employs the information generated from the electronic sources to enrich the learning model for academic purposes. To provide support to e-learning systems, cloud computing is set as a natural platform, as it can be dynamically adapted by presenting a scalable system for the changing necessities of the computer resources over time. It also eases the implementation of data mining techniques to work in a distributed scenario, regarding the large databases generated from e-learning. We give an overview of the current state of the structure of cloud computing, and we provide details of the most common infrastructures that have been developed for such a system. We also present some examples of e-learning approaches for cloud computing, and finally, we discuss the suitability of this environment for educational data mining, suggesting the migration of this approach to this computational scenario.

The data can be collected form historical and operational data reside in the databases of educational institutes. The student data can be personal or academic.

The field of Data Mining is concerned with finding new patterns in large amounts of data. Widely used in Business, it has had a scarce or limited application to the research field of Education. Of course, Data Mining is often applied to the business of education, for example, identification of alumni that are likely to make larger donations. Educational Data Mining (EDM) refers to techniques, tools, and research designed to automatically extract meaning from large repositories of data generated by or related to people's learning activities in educational settings. EDM is an evolving discipline concerned with developing approaches for discovering relationships in the unique and increasingly large-scale data that come from educational domains, and using such approaches to better understand student behavior and learning. Educational systems are increasingly engineered to capture and store data on users" interactions within a system. These data (e.g., extremely large data sets, system log data, & trace data) can be analyzed using statistical, machine learning, and data mining techniques.

The development of computational tools for data analysis, standardization of data logging formats, alongside increased computation/processing power is enabling learning scientists to investigate research questions not previously conceived. EDM discovers patterns

and makes predictions that characterize learner behavior and achievement, domain content knowledge, assessment outcomes, educational functionalities, and applications. For example, learning management systems (LMSs) track information such as when each student accessed each learning object, how many times they accessed it, and how many minutes the learning object was displayed on the user's computer screen. As another example, intelligent tutoring systems record data every time a learner submits a solution to a problem; such systems collect the time of the submission, whether or not the solution matches the expected solution, the amount of time between submissions, the order in which solution components were entered into the interface, etc. The scope and precision of this data is such that even a fairly short session with a computer-based learning environment (e.g., 30 minutes) may produce a large amount of process data for analysis. In other cases, the data is less fine-grained. For example, a student's university transcript may contain a temporally ordered list of courses taken by the student, the grade that the student earned in each course, and when the student selected or changed his or her academic major.

RESEARCH METHODOLOGY

This paper is proposed qualitative research in improving education through data mining. The primary research approach is through the use of a semi structured interview; the research will point out the ideas on a descriptive approach, it will focus on the information flow of supply chain management with the application of Data Mining concept.

The researcher plans to begin the interview in unstructured questions in relevance to the study and often ask for clarification as a form of introduction before to proceed for a specific questions or topics that will answer by the respondents which a semi-structured interview deals with. Then we will organize and put measurements on the collected data according to its similarities and differences. After that we will try to comprehend all the data using an analytical or explanatory approach. This paper has also outlined several future insights on educational data clustering based on the existing literatures reviewed, and further avenues for further research are identified. In summary, the key advantage of the application of clustering algorithm to data analysis is that it provides relatively an unambiguous schema of learning style of students given a number of variables like time spent on completing learning tasks, learning in groups, learner behavior in class, classroom decoration and student motivation towards learning. Clustering can provide pertinent insights to variables that are relevant in separating the clusters.

Educational Data Mining (EDM) describes a research field concerned with the application of data mining, machine learning, and statistics to information generated from educational settings (e.g., universities and intelligent tutoring systems). At a high level, the field seeks to develop and improve methods for exploring this data, which often has multiple levels of meaningful hierarchy, in order to discover new insights about how people learn in the context of such setting. In doing so, EDM has contributed to theories of learning investigated by researchers in educational psychology and the learning sciences. The field is closely tied to that of learning analytics, and the two have been compared and contrasted.

Further to the lines of enquiry undertaken herein, future studies could look at the factors that might affect the differential completion rates among male and female students in the different states in Australia. It would also be useful for account for socio-economic effects when assessing the influence of gender in future studies. So far we see that subject specific research has been done but what about domain specific i.e. how do institutions employ or apply data mining methods to improve on institutional effectiveness? Zimmerman"s educational model states that maintaining and monitoring student’s academic record is an integral activity of

an educational institution. Had used classification algorithm and Prediction algorithm namely decision table and One R algorithm on students" academic record from a previous semester to predict their performance in the current semester. An educational institution maintains and stores various types of student data, it can range from student academic data to their personal record like parents income, parent's qualification etc. In a study conducted by they have proved that student's performance can be predicted by using a data set that consisted of student's gender, its parental education, its financial background etc. Have used Bayesian networks to predict the student outcome based on attributes like attendance, performance in class tests, assignments etc. Researchers have applied.

ACKNOWLEDGEMENT

I would like to thank all the authors of the journals that are written on the reference section. I would never have the guts and courage to finish this research proposal without it. I've learn a lot by reading those and we're very much thankful because it can be used can apply all those knowledge to our future careers. I am one of the frustrated teachers so I am thinking that this kind of study will implement twenty years from now so that we can focus and apply the technology on teaching. I am fond of reading and maybe this is one way to have an effective teaching for this kind of research.

I give thanks also to our professor in this subject for giving us this kind of task. It was so challenging yet a big help on our field and to my future career.

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TITLE: "EFFECTIVENESS OF USED COFFEE GROUNDS AND GREEN TEA AS A FERTILIZER"

Angelo Edward L. Jacinto
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John Andrew A. Tiria

INTRODUCTION

In accordance to the current time, the world was facing with various headlines about the status of the environment such as the following: climate change, pollution of environment and overuse of many resources. One of the examples of this problem on how the waste can be reused for very beneficial purposes is the usage of spent coffee grounds and tea bags which has a big potential of being a fertilizer. It has been found out that the level of antioxidants is actually higher in spent coffee grounds and tea leaves compare to the unused coffee grounds and tea leaves respectively.

This research aims to compare whether the spent coffee grounds and tea leaves can be used as an alternative fertilizer. It aims to answers the following questions such as the following: if these two major raw materials can have an impact in terms of the growth and development of plants and to determine if there were an adequate amount of nitrogen, phosphorus and potassium (NPK) content of the fertilizer which can be compared to commercial fertilizers.

The conceptual framework of the study represents the relationship on how the parameters mentioned: input, process and output that they are interrelated to each other which has a goal of achieving the major objective of the study. It is represented by the figure below:

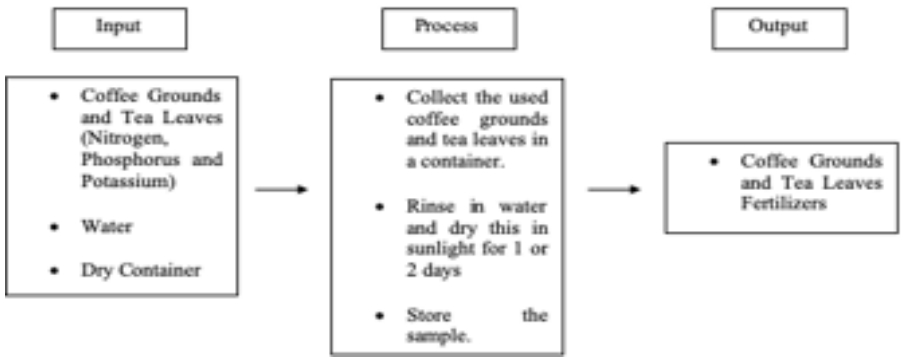

Figure 1. Conceptual Framework of the Study (Process of Spent Coffee Grounds and Tea Leaves Used as Fertilizer for Plants)

The general objective of the study is to compare if spent coffee grounds and tea leaves fertilizer can be used as an alternative to the commercial chemical fertilizer for the purpose of the growth of plants. It also aims specifically to the following: to describe the similarities and differences in the growth and development of plants using coffee grounds and tea leaves as an alternative fertilizer and commercial fertilizer in terms of the following such as the time and length of sprout, leaves, stem and fruit produced and also to determine the characteristics of the fertilizer being produced from these two major raw materials.

The study can be very beneficial to the following: to the community, it can be an alternative fertilizer compared to the commercial chemical fertilizers which are found in the market which potentially helping urban communities become greener and more sustainable. To the environmental and scientific field, it can help nourish the soil and promote the healthy and fast growth of plants. To the development of medical technology, it can be an alternative component of growing media to partially replace commercial peat (CP) and fertilizers in the production of potted plant. To the future researchers, it can serve as a reference for future studies and take into account any revisions.

MATERIALS AND METHODS

This section of the study explains the type of research methodology being used in the conduct of the study. With reference to the analysis of the review of related literature and studies, it shows up very well and a very clear discussion about the potential benefits of the spent coffee grounds and green tea bags respectively.

The approach being used in the study is also known as the experimental method of research. This strategy of research explains that there must be a proper experiment to be done in order to obtain the main and specific objectives and also the answers to the statement of the problem of the study. This approach is highly technical and very scientific in nature.

The steps being conducted in the study are the following: first, spent coffee grounds were obtained from a local coffee shop and green tea bags in Manila. Second, there will be a preparation of fertilizer by washing, straining, drying for 1 – 2 days and storing the samples. Third, there will be a construction of coffee grounds and tea bags where it must be rinse in water and dry it for 1 – 2 days then store it in dry container then put approximately a little amount of the sample then followed by the gathering of data though the recording of the similarities and differences parameters in the growth and development between coffee grounds and tea leaves fertilizer, commercial fertilizer and control which are the following: average number of leaves, average height in centimeters and average width of leaves in centimeters then followed by the analysis of the amount of nitrogen, phosphorus and potassium (NPK) content of the fertilizer through the rapid soil test.

Shown in the table below are the materials being used for the conduct of the study.

Table 1
Materials Being Used for the Conduct of Study

Name of Material	Description
1. Flowering Pot	It is used where the soil and fertilizer can be placed.
2. Soil	It is the material where the fertilizer will be mixed.
3. Pechay Seed	It is the substance where it will be plant on the flowering pot.
4. Shovel	It is used to put the soil in the flowering pot.
5. Container	It is used to store the soil with fertilizer.
6. Strainer	It is used to drain the excess water.
7. Weighing Scale	It is used to measure weight or mass of the sample.
8. Beaker	It has a function to determine the amount of volume of a liquid.
9. Spent Coffee Grounds and Green Tea Bags	These are the two major raw materials of the study.

The type of analysis used in the research which determines the amount and quality of nitrogen, phosphorus and potassium (NPK) content of the fertilizer through the rapid soil test.

RESULTS AND DISCUSSION

The following are the results of this research after the research has been performed:

Table 2
General Growth Stages of Plants

General Growth Stages						
Stages of Growth	Spent Coffee Grounds and Green Tea Leaves Fertilizer		Commercial Fertilizer		Control	
	Time of Growth	Description	Time of Growth	Description	Time of Growth	Description
Seed	5 – 7 Days After Sowing	4.20 cm	5 – 7 Days After Sowing	4.20 cm	5 – 7 Days After Sowing	4.10 cm
	No. of Leaves	2.00 cm	No. of Leaves	2.00 cm	No. of Leaves	2.00 cm
Seedling Stage	1 – 2 Weeks	5.50 cm	1 – 2 Weeks	5.30 cm	1 – 2 Weeks	5.10 cm
	No. of Leaves	4.00 cm	No. of Leaves	4.00 cm	No. of Leaves	3.00 cm
Vegetative Stage	3 – 4 Weeks	6.30 cm	3 – 4 Weeks	6.30 cm	3 – 4 Weeks	6.20 cm
	No. of Leaves	5.00 cm	No. of Leaves	4.00 cm	No. of Leaves	4.00 cm
Reproductive Stage	5 Weeks Onwards	7.20 cm	5 Weeks Onwards	6.70 cm	5 Weeks Onwards	6.40 cm
	No. of Leaves	6.00 cm	No. of Leaves	5.00 cm	No. of Leaves	5.00 cm

The table above shows the general growth stages of pechay seed with the three types of fertilizer: spent coffee grounds and green tea leaves, commercial and control. The control serves as the reference between these types of fertilizer.

Figure 2. Spent Coffee Grounds and Green Tea Leaves Fertilizer

The figure above is the finish product which is the fertilizer made from spent coffee grounds and green tea leaves which is used to incorporate it with the soil in order to grow the pechay plant.

Figure 3. The Process on How the Pechay Plant Grow Using the Fertilizer Made from Spent Coffee Grounds and Green Tea Leaves

The figure above shows the process on how the pechay plant grew using the fertilizer made from spent coffee grounds and green tea leaves. It is composed of the soil and seed in the container (left figure) followed by the starting of the grow of the seed (middle figure) and the pechay plant (right figure) which is the stage where the plant grew using the fertilizer being created.

Using the rapid soil test, the analysis of the quality and amount of nitrogen, phosphorus and potassium (NPK) content of the fertilizer follows where the pH level is at 7.60, the soil is low in nitrogen, moderately low in phosphorus and sufficient in potassium based on the experiment.

CONCLUSIONS

The following are the conclusions and recommendations can be obtained from the study which can be further enhanced or improved are the following: not only to minimize the amount of spent coffee grounds and tea leaves waste but also to create a more efficient fertilizer. It is a positive reinforcement because they are rich in nutrients needed.

The following are the recommendations can be inferred from this study: this fertilizer has major potential to be an alternative to the commercially available fertilizer however, further studies must be conducted in order to see its full potential. It adds organic material that can improve drainage, water retention and aeration of the soil which can further enhance the growth of a plant.

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STUDENT PORTAL FOR GLOBAL RECIPROCAL COLLEGES

Ma. Jasmine Rose D. Macasil
Sherwin Keith Rivera

INTRODUCTION

A student portal is an online system where students and school staff can log into a school website to access important information and have a direct communication between the student and administrators.

Colleges and universities commonly used student portal where information and necessary updated news must be available to a large population of students. Some colleges and universities also use portals for educational purposes, learning, and fun.

The Student Portal has a function like administration, teaching, distributing information and communication for students, teachers and administrators.

SCOPE AND LIMITATION OF THE STUDY

Scope

Security module - in this module each user has different types to their accounts.

- All user
  - Login account
  - Restore account
  - Registration
- Administrator
  - History logs

User management module - each user has different types to their accounts and privilege on system.

- Administrator
  - Can add, edit, delete of all users.
- Professor (Limited access of all users)
  - Can add student on their subject.

Communication module - in this module, the user can communicate to others related to school activities and events, or any concern any about to their grades.

- Professors / Department / Student
  - Can manage contents of the website. (Limited access on other's post.)
  - Can send messages to all kinds of users.

Assignment module – in the module, the user can manage of about assignments.

- Professors
  - Can add, edit, delete, and download assignments.

- Students
  - Can download assignments.

Examination module - in the module, the user can manage of about examinations.

- Professors
  - Can add, edit, and delete examinations.
  - Can view examination's result.
- Students
  - Can take examinations.

Attendance module - in the module, the user can manage of about attendance.

- Administrator / Professors
  - Can control attendance.
  - Can view all attendance report.
- Students
  - Can view own attendance.

Grading module - in the module, the user can manage, and the grades.

- Professors
  - Can add, edit, and delete student's grades.
  - Can compute the grades of students.
- Administrator / Students
  - Can print student's grade.

Scheduling module - in the module, the user can create schedule and its information. The user can manage also the schedule.

- Professor
  - Can add, edit, and delete examination, and assignment's schedule.
- Students
  - Can view events, examinations, class, and assignment's schedule.

Media module - the user can manage of their pictures and videos.

- All users
  - Can add, edit, and delete gallery album of images and videos.

Parent module - in the module, the user can view the concern students' information.

- Parents
  - Can monitor the performance of their children.

Survey module – the user can make a voting poll about the topic the need to talk about.

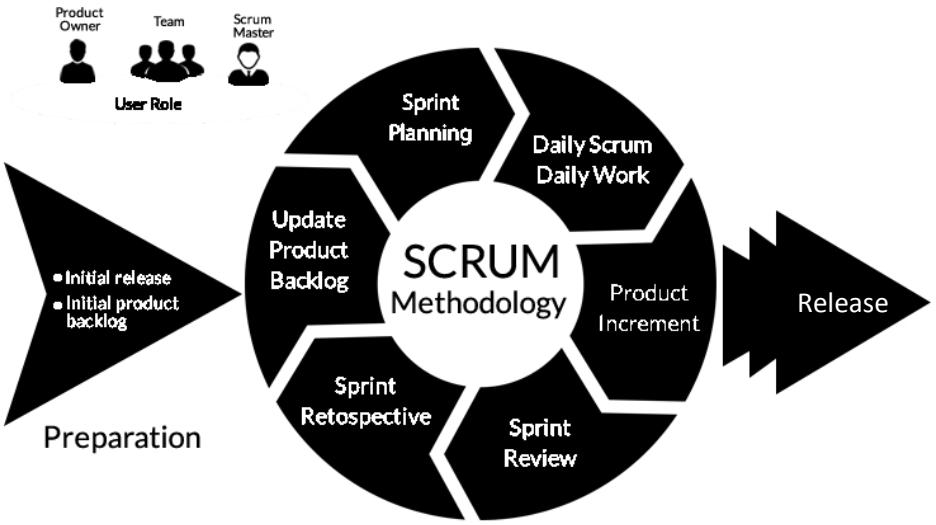
- All users
  - Can vote on poll.
- Administrator
  - Can make a poll.

Limitation

- Students can't pay tuition and other school expenses online.
- Can't create group messaging.
- Can't enroll online.

METHODOLOGY

The Agile Scrum Methodology is a framework for project management that emphasizes teamwork, accountability and iterative progress toward a well-defined goal. The framework, which is often part of Agile Software Development, is named for a rugby formation. This process helps the proponents to encourage to learn through experiences, self-organize while working on a problem, and reflect on their wins and losses to continuously improve.



RESULT

Capabilities, Limitations, and Beta Test

Table 8
Security Module

Capabilities	Limitations	Remarks
Login account		Done
Restore account		Done
Registration		Done
History logs		Done

Table 9
User Management Module for Administrator

Capabilities	Limitations	Remarks
Add users		Done
Edit users		Done
Delete users		Done

Table 10
User Management Module for Professor

Capabilities	Limitations	Remarks
Add users	Only the students	Done
Add subjects	Only the students	Done

Table 11
Communication Module for Administrator

Capabilities	Limitations	Remarks
Manage content of the student portal		Done
Send SMS and email to all kind of users	Group message	Done

Table 12
Communication Module for Administrator

Capabilities	Limitations	Remarks
Manage content of the student portal	Only their post	Done
Send SMS and email to all kind of users	Group message	Done

Table 13
Assignment Module for Administrator and Professor

Capabilities	Limitations	Remarks
Add assignment		Done
Edit assignment		Done
Delete assignment		Done
Download assignment		Done

Table 14
Assignment Module for Student

Capabilities	Limitations	Remarks
Download assignment		Done

Table 15
Assignment Module for Administrator and Professor

Capabilities	Limitations	Remarks
Add examination		Done
Edit examination		Done
Delete examination		Done
View examination's result		Done

Table 16
Examination Module for Student

Capabilities	Limitations	Remarks
Take examination		Done

Table 17
Attendance Module for Administrator and Professor

Capabilities	Limitations	Remarks
Can control attendance		Done
Can view all attendance report		Done

Table 18
Attendance Module for Administrator and Professor

Capabilities	Limitations	Remarks
Can view own attendance		Done

Table 19
Grading Module for Professor

Capabilities	Limitations	Remarks
Add student's grades		Done
Edit student's grades		Done
Delete student's grades		Done
Compute the grades of students		Done

Table 20
Grading Module for Student and Administrator

Capabilities	Limitations	Remarks
Print student's grade		Done

Table 21
Scheduling Module for Administrator

Capabilities	Limitations	Remarks
Add event, examination, class, and assignment's schedule		Done
Edit event, examination, class, and assignment's schedule		Done
Delete event, examination, class, and assignment's schedule		Done

Table 22
Scheduling Module for Professor

Capabilities	Limitations	Remarks
Add examination and assignment's schedule		Done
Edit examination and assignment's schedule		Done
Delete examination and assignment's schedule		Done

Table 23
Scheduling Module for Student

Capabilities	Limitations	Remarks
View event, examination, class, and assignment's schedule		Done

Table 24
Media Module

Capabilities	Limitations	Remarks
Add albums of images and videos		Done
Edit albums of images and videos		Done
Delete albums of images and videos		Done

Table 25
Parent Module for Parent

Capabilities	Limitations	Remarks
Monitor the performance of their sibling		Done

Table 26
Invoice Module for Parent and Student

Capabilities	Limitations	Remarks
View invoice	Pay online	Done
Print invoice	Pay online	Done

Table 27
Voting Module

Capabilities	Limitations	Remarks
Vote on poll		Done

Table 28
Voting Module for Administrator

Capabilities	Limitations	Remarks
Make on poll		Done

DISCUSSION

The summary of our studied was discussed on this chapter; the proponent research is Student Portal for Global Reciprocal Colleges that help them to direct communication and interaction between the school and students. It does also help them to solve their current problem and the inconvenience of their manual system.

CONCLUSION

This thesis entitled “Student Portal for Global Reciprocal Colleges” It provides information about our school. Have a faster communication between the staff and students. Students can send messages to all kinds of user, download assignment, take examination, view own attendance, know available subject on that semester, view receipt of payment, vote on poll and also can view events, examination, class, and assignment’s schedule. Thus the project is the user friendly approach.

RECOMMENDATION

The proponents strongly recommended the implementation of Student Portal for Global Reciprocal Colleges. When the schools start to use, it has a big benefit to everyone and to the incoming students. The following statements are recommended.

The proponents proposed system will help he institution to improve the following: (1) To help user to communicate to each other; (2) To get grades and verify the concern grade much easier; (3) To inform the incoming students about the process of the school, rules and regulation and the responsibility of each department; (4) To inform the students about the members and leaders of the organization, incoming events and schedules.

MORINGA (MORINGA OLEIFERA) FRUIT SKINS AS POTENTIAL SOURCE OF TEXTILE FIBRE

Maria Teresa F. Modesto

INTRODUCTION

Textile manufacturing is a major industry. . This industry is based on the conversion of fiber into yarn, yarn into fabric. The fabric is then used to produce clothing. The fiber produced can also be a raw material for other products like ropes, bags, shoes and the like. According to Aguilar (2015), Science and Technology takes concrete steps through Philippine Textile Research Institute's thrusts to encourage more textile development and manufacturing to take place in our country, leading the future of Philippine textile.

The Department of Science and Technology through the Philippine Textile Research Institute had studied and identified and still doing researches on the natural sources of textile fibers in our country. Among the plant-based natural sources of textile fibers identified in the Philippines are: abaca (pseudo stem), banana (pseudo stem), cornhusk, pineapple leaf, sugarcane bagasse, rice straw, sorghum stalk, jute stem, bamboo, sponge gourd fruit, snake plant, cotton pods, and coconut husk.

Philippine farmers (small and medium) can engage in the production of crops in which the plant residues of the main product can be a source of textile fiber, thus, turning the trash into cash, an additional income for farmers. This notion can be attained with the "know-how" support from the government especially the Department of Agriculture and Department of Science and Technology.

Taking the above considerations, it is worthy to study further other plants that can be potential sources of textile fibers.

MATERIALS AND METHODS

Materials

Moringa fruit pods
table spoon
basin
tap water
kitchen pot

Methods

Fruit Skins Preparation

Moringa fruits were harvested in green medium matured stage. The long, slender, triangular fruits were opened following its length. The flesh and tender seeds were scraped off using table spoon leaving the tube of outer skin.

Retting

The outer skins of the fruits were immersed and soaked in tap water with the use of plastic basin for five (5) consecutive days. Changing of water was done daily in order to remove the detached flesh from the fruit skins.

After five (5) days of soaking, much of the impurities were separated from the fibers. Fibers were washed with tap water to finally clean them and air dried.

Fiber Evaluation

The fibers extracted were tested on the following criteria: tenacity, moisture regain, thermal properties, and dyeing.

Tenacity was evaluated by stretching and bending the fiber after air drying. To test its moisture regain capacity, the air dried fibers were immersed in water for 5 minutes. Fibers were subjected to water boiling for 20 minutes to evaluate its thermal properties. The air dried fibers were dyed to test if they absorb coloring materials.

RESULTS AND DISCUSSION

The fruits were opened following its length. The opened fruits exposed the flesh and seeds. Since flesh and seeds of Moringa are nutritious, they were scraped off to be used as vegetable. As shown in Figure 1, the discarded fruit skins were used as the material where the fibers could be extracted.

Figure 1. Fruit Skins of Moringa Ready for Soaking

The fruit skins were immersed and soaked in tap water for five (5) consecutive days. In this process, the small amount of flesh attached to the skins became loose and eventually detached from the fibers. The green color of the fruit skins when freshly harvested turned to separate as powdery material during the duration of soaking. There was foul odor on the set-up during the first day of soaking until the fifth day. This was due to the green coloring and the flesh that eventually detached from the fruit skins begun to decompose. To minimize the undesirable odor, daily changing of water in the soaking medium was resorted. Figure 2 shows the soaked fruit skins.

Figure 2: Soaking of Fruit Skins

After five (5) consecutive days of soaking, there were also strips of elongated woody material present beneath the skins and were loosely separated from the fibers (Figure 3).

Figure 3: Strips of Woody Material (lower), Fiber Obtained (upper)

The fibers obtained were washed with tap water to wash-off the flesh and powdery materials that were detached and were air dried for further evaluation (Figure 4). Sample grip of fibers were stretched to determine if they were tensile. It was observed that samples did not break despite of soaking for five consecutive days. The "tenacity" characteristic of the samples showed that they are potential source of textile fiber.

Figure 4: The Moringa Fruit Skin Fibers after Soaking and Air Drying

Further, the samples were subjected to heat treatment by boiling them in water for twenty (20) minutes. After this treatment, they were allowed to cool, washed with water, and air-dried (Figure 5). Samples were stretched and bent to determine if they resisted heat treatment. It was revealed that samples were heat resistant because they did not break when stretched and bent after twenty minutes of boiling and air dried.

Figure 5: Moringa Fruit Skin Fibers after Heat Treatment and Air Dried

The extracted fibers (air dried) were also evaluated as to its ability to hold water. The fibers were found out to retain water – a characteristic of a textile fiber. An air dried sample fibers were also subjected to color retention. They were soaked in a coloring solution for five minutes, after which air drying followed. The colored air dried fibers were washed with water to determine its color retaining ability. The fibers retain the color after washing – which is a feature of a textile fiber.

CONCLUSIONS

The Moringa fruit pods' fibers were resistant to soaking in water and boiling water heat treatments. The fibers resisted to stretching and bending after they were subjected to water soaking and water heat treatments because they did not break. The result implies that they possess "tenacity" feature, an important characteristic of a textile fiber. In addition, the fibers were water absorbent and have the ability to retain color. Considering these characteristics, the Moringa fruit skin fiber is a potential source of plant based textile fiber.

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ON SPHENIC NUMBER: PROPERTIES, RELATIONSHIPS, AND APPLICATION IN RSA CRYPTOSYSTEM

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INTRODUCTION

A world without mathematics is a world without truth. Mathematics is essential in human lives as it exposes the importance of everything. Although numbers are just a product of the mind which primarily aimed to give an exact quantity or measurement in everyday life, number theorists were able to study numbers through the use of numerals and write them in different forms - be that in Roman, Hindu-Arabic or other forms of numerals. Eventually, numbers have become convenient in different fields, including but not limited to economics, finance, industry, security, and etc.

These numbers are very useful in the field of military as they are used to propel information and this process is called cryptography. Cryptography is critical in the field of number theory since it is very advantageous especially during the World War II. Mathematicians as cryptologists are very rare at this point in time since the great John Nash died. This paper will show the different properties of sphenic numbers, its relationship to other integer sequences, and application to RSA cryptosystem in key-generation system.

METHODOLOGY

This study used expository and descriptive methods of research. According to Igwenagu (2014) expository research is based purely on existing data and usually leads to "review – type reports". The research involves reading broadly on a field, comparing and contrasting, analyzing and synthesizing all points of view and developing new insights. In addition to this, this study used descriptive method to provide an aphoristic definition of the concepts related to sphenic number. Ac Dulock stated that descriptive research is to describe systematically and accurately the facts and characteristics of a given population or area of interest. Hence, it is an appropriate method to show the results in this study.

RESULTS AND DISCUSSION

Definition 1. Sphenic number is a positive integer which is the product of exactly three distinct primes.

Example 1. Form a sphenic number between primes 2,3,5,7,and 11.

Solution. Using the definition of sphenic number, let $p_1 = 2$, $p_2 = 3$, $p_3 = 5$, $p_4 = 7$, and $p_5 = 11$. Then, the number of sphenic numbers in the set of prime numbers is $\binom{5}{3} = 10$. These are

$$p_1p_2p_3 = (2)(3)(5) = 30$$
$$p_1p_2p_4 = (2)(3)(7) = 42$$
$$p_1p_2p_5 = (2)(3)(11) = 66$$

$$p_2p_3p_4 = (3)(5)(7) = 105$$
$$p_2p_3p_5 = (3)(5)(11) = 185$$
$$p_3p_4p_5 = (5)(7)(11) = 385$$
$$p_2p_4p_5 = (3)(7)(11) = 231$$
$$p_1p_2p_4 = (2)(3)(7) = 42$$
$$p_1p_3p_4 = (2)(5)(7) = 70$$
$$p_1p_3p_5 = (2)(5)(11) = 110$$

Properties of Sphenic Numbers

Property 1. The number of divisors of Sphenic number is even.
Example 2. Let $n = 78$ such that $n = 2 \cdot 3 \cdot 13$ then

$$\tau(78) = \tau(2) \cdot \tau(3) \cdot \tau(13)$$

$$\tau(78) = 2 \cdot 2 \cdot 2 = 8$$

Thus, the number of divisor of Sphenic number is even.

Property 2. Every Sphenic number has exactly 8 positive divisors.

Example 3. Let $n = 1505$ then $n = 5 \cdot 7 \cdot 43$ then

$$\tau(1505) = \tau(5) \cdot \tau(7) \cdot \tau(43)$$

$$\tau(1505) = 2 \cdot 2 \cdot 2 = 8.$$

Property 3. If n is Sphenic,$\sigma(n) > n$.
Example 4. Let $n = 805$ such that $n = 5 \cdot 7 \cdot 23$ then

$$\sigma(805) = \sigma(5) \cdot \sigma(7) \cdot \sigma(23)$$
$$= (5+1)(7+1)(23+1)$$
$$\sigma(805) = 6 \cdot 8 \cdot 24$$
$$\sigma(805) = 1152.$$

Thus, $\sigma(805) > 805$.
Property 4. Every Sphenic number in the form of $n = pqr$, for all distinct odd primes p, q, and r , $\sigma(n)$ is even.
Example 5. Let $n = 3731$ such that $n = 7 \cdot 13 \cdot 41$ then

$$\sigma(3731) = \sigma(7) \cdot \sigma(13) \cdot \sigma(41)$$
$$= (7+1)(13+1)(41+1)$$
$$= 8 \cdot 14 \cdot 42$$
$$\sigma(3731) = 4704.$$

Thus, $\sigma(3731)$ is even.
Property 5. If n is Sphenic number, then $\sigma(n) - n = pq + qr + pr + p + q + r + 1$ for every primes p, q, and r.
Example 6. Let $n = 1729$ such that $n = 7 \cdot 13 \cdot 19$ then

$$\sigma(1729) = \sigma(7) \cdot \sigma(13) \cdot \sigma(19)$$
$$= 8 \cdot 14 \cdot 20$$
$$\sigma(1729) = 2240$$

That is

$$\sigma(1729) = 1729 + 91 + 133 + 247 + 7 + 13 + 19 + 1$$
$$\sigma(1729) = 2240.$$

Property 6. If n is Sphenic number, $\mu(n) = -1$.
Example 7. Let $n = 2185$ such that $n = 5 \cdot 19 \cdot 23$ then

$$\mu(2185) = \mu(5 \cdot 19 \cdot 23)$$

By definition of $\mu(n)$ gives

$$\mu(2185) = (-1)^3 = -1.$$

Property 7. If n is Sphenic number, then $\phi(n)$ is even.

Example 8. Let $n = 9601$ such that $n = 13 \cdot 17 \cdot 41$ then

$$\phi(9601) = \phi(13 \cdot 17 \cdot 41)$$
$$= \phi(13) \cdot \phi(17) \cdot \phi(41)$$
$$= (13-1)(17-1)(41-1)$$
$$\phi(9601) = 12 \cdot 16 \cdot 40$$
$$\phi(9601) = 7680.$$

Thus, $\phi(9601)$ is even.

Property 8. Every even Sphenic number with prime factors of p and q, then $\phi(n) < \sigma(n)$.

Example 9. Let $n = 5083$ such that $n = 13 \cdot 17 \cdot 23$ then

$$\phi(5083) = \phi(13 \cdot 17 \cdot 23)$$
$$= \phi(13) \cdot \phi(17) \cdot \phi(23)$$
$$= 12 \cdot 16 \cdot 22$$
$$\phi(5083) = 4224$$

And

$$\sigma(5083) = \sigma(13 \cdot 17 \cdot 23)$$
$$= \sigma(13) \cdot \sigma(17) \cdot \sigma(23)$$
$$= 14 \cdot 18 \cdot 24$$
$$\sigma(5083) = 6048$$

Thus,

$$\phi(5083) < \sigma(5083).$$

Property 9. Every Sphenic number in the form of $p, q,$ and r, $\phi(n) - n = p + q + r - (pq + pr + qr + 1)$.

Example 10. Let $n = 102$ such that $n = 2 \cdot 3 \cdot 17$ then

$$\phi(102) = \phi(2 \cdot 3 \cdot 17)$$
$$= \phi(2)\phi(3)\phi(17)$$
$$\phi(102) = 32$$

That is

$$\phi(102) - 102 = 2 + 3 + 17 - (6 + 51 + 34 + 1)$$
$$32 - 102 = 22 - 92$$
$$-70 = -70.$$

Relationship of Sphenic Number to other Integer Sequences

Sphenic number is related to square-free number, and admirable number.

Relationship 1. Every Sphenic numbers are square-free numbers.

Proof. Suppose that n is a sphenic number but not square-free number then there exists an integer $\alpha > 1$ such that $p^{\alpha}|n$. But by definition 3 (definition of Sphenic number), it is a contradiction since p^{α} is not distinct. Thus, every sphenic number is square free number. ■

Relationship 2 Every sphenic number n is admirable number if n is in the form of $6p$, for any prime $p > 3$.

Proof. Let n be a sphenic number such that $n = 6p$, for any primes $p > 3$. Then by definition of admirable number, it follows that n is also admirable since

$$\sigma(n) = \sigma(6p)$$

$$= \sigma(6)\sigma(p)$$

$$= \sigma(2)\sigma(3)\sigma(p)$$

$$= 12(p+1)$$

$$\sigma(n) = 2(6p) + 2(6).$$

That follows the definition of admirable number. ■

Application of Sphenic number in RSA Cryptosystem

Definition 2. RSA Cryptosystem

RSA encryption is a public-key encryption technology developed by RSA Data Security. The RSA algorithm is based on the difficulty in factoring very large numbers. Based on this principle, the RSA encryption algorithm uses prime factorization as the trap door for encryption. Deducing an RSA key, therefore, takes a huge amount of time and processing power. RSA is the standard encryption method for important data, especially data that's transmitted over the Internet.

RSA stands for the creators of the technique, Rivest, Shamir and Adelman.

The RSA cryptosystem is an example of a "public key" system. This means that everyone can know the encryption key, but it is computationally infeasible for an unauthorized person to deduce the corresponding decryption key.

At the center of the RSA cryptosystem is the RSA modulus N. It is a positive integer which equals the product of two distinct prime numbers p and q:

RSA modulus:$N = pq$

Also needed is an encoding exponent e. The only requirement on e is that

$$\gcd\big(e, \phi(N)\big) = 1$$

To encode a message m, the sender computes the remainder when m^e is divided by N:

Encoding: $M = m^e mod\ N$

To decode the message M, the receiver uses the values p and q. After picking N and e, she computes d by:

Decoding exponent: $d = e^{-1} mod\ \phi(n)$

Using d as decoding exponent, the receiver will decode the message by computing

Decoding: $m = M^d mod\ N$.

Proposed RSA Algorithm

1. Suppose that the key generation composed of 3 Mersenne primes p, q, and r.
2. Compute for Sphenic number n, $n = pqr$.
3. Compute for $\phi(n) = (p-1)(q-1)(r-1)$.
4. Chooses e, $1 < e < \phi(n)$ such that $\gcd\big(e, \phi(n)\big) = 1$.
5. Find d such that $ed = 1 mod\ \phi(n)$.

Now the receiver's public key pair is (n, e) and the private key is d.

Encryption Process:

To encrypt a message m, the sender computes $c = m^e mod\ n$ and sent this to the receiver

Decryption Process:

To decrypt c, the receiver computes $m = c^d mod\ n$.

Example 11. Let n be a Sphenic number such that $n = pqr$.
Step 1: Let $= 3\ q = 5$, and $r = 7$
Step 2: We get $n = 105$
Step 3: compute for $\phi(n)$, $\phi(105) = \phi(3 \cdot 5 \cdot 7)$

$$= (3-1)(5-1)(7-1)$$
$$= 2 \cdot 4 \cdot 6$$
$$\phi(105) = 48$$

Step 4: Choose e, $1 < e < \phi(105)$,

Choose $e = 5$

Step 5: Find d, $ed = 1mod\ (\phi(105))$
That is

$$5d = 1mod(48)$$
$$d = 29.$$

So, the public key is $(5,105)$ and the private key is $(29, 105)$
Encryption Process:
Suppose that message b = 3
Then

$$3^5 mod\ 105 = 243 mod\ 105$$

$$3^5 mod\ 105 = 33$$

And this sends to A.
Decryption Process:
To decrypt c, A computes

$$33^{29} mod\ 105 = 3.$$

Thus,
The message is b.

CONCLUSION

Based on the findings of the study, the following conclusions were formulated:

1. Sphenic number is a positive integer formed by the product of three distinct prime numbers.

2. Sphenic number has interesting properties in using number theoretic function such as tau, sigma, Mobius, and phi function that can be useful in learning elementary number theory.

3. Relationship of Sphenic numbers to other integer sequences such as square free number and admirable number discussed using thorough observations.

4. Sphenic numbers are applied in creating generation key in RSA cryptosystem to make the conversation be done secretly.

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SOLAR SECURITY STREET LIGHTS

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INTRODUCTION

Many devices are useful to mankind nowadays, and one of the most beneficial is the closed-circuit television or the CCTV. CCTV (closed-circuit television) is a TV system in which signals are not publicly distributed but are monitored, primarily for surveillance and security purposes. its structures and functions enough to compromise safety and better monitoring purposes? Thus, we offer the idea of providing an amount of electricity to a CCTV camera to provide a 24/7 security system within an area and a speaker alarm for announcement and emergency purposes through a solar panel. The CCTV camera with a speaker alarm that works through solar panel must contain a 360-degree HD camera for better viewing of the video along the area and for better monitoring purposes. This device shall assess improvements and greater quality to meet the necessity of safety throughout the certain vicinity. It also tends to develop security and make it tighter through the alarm which also enhance its accessibility and finally, foster a danger-free place.

The importance of this study is to introduce a device which will be of great help to the world where danger lives with us. With this study, people will be informed that a certain device can exist and that it could be done to create a better place where safety is being treasured. The purpose of this study is to be able to come up with a new idea about the benefits of solar power through making a device that uses it wisely and precisely. It also helps fill minds about how creative and innovative modern technology can get. The reason of the researcher in choosing this is to know the components and features of solar power and to create their own product using it. The sun, being the initiator of energy of everything and having its massive capacity makes it the most powerful source of electricity. This research will introduce and explain how solar power can be effective and efficient to humans in terms of putting it into great use. As time flies, technology continues to follow a trend of improving every single bit of it way better and surpass what it has done before and make what it hasn't yet.

Solar power is the conversion of sunlight into electricity, either directly using photovoltaic (PV), or indirectly using concentrated solar power. Concentrated solar power systems (Unified Solar) use lenses or mirrors and tracking systems to focus a large area of sunlight into a small beam. Photovoltaic convert light into an electric current using the photovoltaic effect. The International Energy Agency projected in 2014 that under its "high renewables" scenario, by 2050, solar photovoltaic and concentrated solar power would contribute about 16 and 11 percent, respectively, of the worldwide electricity consumption, and solar would be the world's largest source of electricity. Being the world's premium energy, solar power would really be reliable a hundred percent in terms of being the main source of power for a new device.

STATEMENT OF THE PROBLEM

The objective of this study is to find out the efficient solar security street lights. Before the researches formulated each questions in this questionnaire, they conduct research that are all related to their topic and gathered data an information from different internet website, online books and library books. Specifically it's answer the following questions:

1. What is the Protection of Solar Security Street Lights?

2. What is the Prevention of Solar Security Street Lights?

3. What are the Problems encountered of Solar Security Street Lights.

4. What are the Benefits of Solar Security Street Lights?

5. Uses of Solar Security Street Lights.

SIGNIFICANCE OF THE STUDY

The findings of this study will reflect to the benefit of the society considering solar power as well as CCTV plays a big role in both in science and technology. The greater advancement of creating a new form of technology out of solar power or using it would be a big contribution not just in the modern technology but also in history. The greater the advancement, the better life gets. Moreover, this research will provide information on creating a new device which will produce effective result when it's already done and being used.

Researchers hope and as well as pray that the guidance of the Almighty God may be with them in conducting this study. May the researchers comprehend and learn the reacquire information about their thesis.

FACULTY/TEACHER uses the gather information as a new sample or ideas in teaching some matter about training methods or techniques.

ADMINISTRATOR will get some information to be able to help in providing better resources and it will improve in some ways for both students and professor for their better approach in teaching and learning.

PARENTS should be proud of what we have done now in this study because they are our inspiration and light in the path we are taking. We are hoping that they will also acquire new facts and knowledge about this study.

DEFINITION OF TERMS

Solar Panel

(UM) – Devices that collect energy from the sun (solar energy). This is usually solar photovoltaic (PV) modules that use solar cells to convert light from the sun into electricity, or solar

Thermal (heat) collectors that use the sun's energy to heat water or another fluid such as oil or antifreeze.

(OM) – A panel designed to absorb the sun's rays as a source of energy for generating electricity or heating.

Crystalline Silicon

(UM) – That has an ordered atomic structure. It is used in almost all integrated circuits in the

Electronics. Fabricated from quartzite, a pure form of sand, the quartzite is treated (see below) to create polycrystalline silicon (polysilicon), very pure silicon with multiple single-crystal regions of different sizes and orientations. The polysilicon is used to "grow" a single-crystal (monocrystalline) ingot that is sliced into wafers.

(OM) – A type of photovoltaic cell made from a slice of single-crystal silicon or polycrystalline silicon.

Watt

(UM) – A unit of power; the power required to do work at the rate of 1 joule per second, while his equal to the power dissipated in an electric circuit in which a potential difference of 1 volt causes a current of ampere o flow.

(OM) **–**The basic unit used to measure the capacity of solar panels and other electricity generating devices.

LED

(UM) **–** is a two-lead semiconductor light source. It is a p–n junction diode, which emits light when activated. When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons.

(OM)**–** Light-emitting diode.

Mono-crystalline

UM) **–** is the base material for silicon chips used in virtually all electronic equipment today Mono- Si also serves as photovoltaic, light-absorbing material in the manufacture of solar cells.

(OM) **–** structures are composed of a single crystal throughout. Contrast with poly crystalline.

RESEARCH METHODOLOGY

Research Design

To realize the objective of the study, the researchers used the descriptive design method. This method design for the investigation to gather information about the respondent opinion regarding to the Solar Security Street Lights focusing on nature of the situation as they existed at the time of the study. This study is to provide a certain amount of electricity to a CCTV camera to provide a 24/7 security system within the area and a speaker and alarm for announcement and emergency purposes through a solar panel. Respondents are Seventy Five (75) from different barangays officials of different cities were and subjected to answer the survey questionnaires.

Research Instrument and Data Gathering Procedure

The instructive interview, wherein the researchers prepared a list of questions in pre-determined order. The data for this study were collected using the survey questionnaire, and the results of the study are presented in tabulation and were interpreted by the researcher.

Statistical Treatment

In the analysis and interpretation of the data gathered, a statistical treatment was used.

Percentage – this was used to determine the personal profile of the respondents and the data collected from the respondents, in terms of the survey lends them.

P= F/N (100)

Where:

P – Percentage
F – Frequency
N – Total of respondents

RESULTS AND DISCUSSIONS

The results of the study are presented in tabulation and were interpreted by the researchers.

Table 1 shows the Protection of Solar Security Street Lights according to hands-on training techniques of the 5 out of 25 items in this questionnaire; in these protections, the highest weighted mean is Elevated pole with 60%, Wide/Thick Pole and Good Foundation with 40%, Signs must be visible with 36%, and the lowest is Put a Lightning Rod and Put a barrier in alarm system with 34.67%. The result reveals that the respondents are in favor in the Protection of Solar Security Street Lights.

Table 1
Protection of Solar Security Street Lights

Protection of Solar Security Street Lights	5 Strongly Agree		4 Slightly Agree		3 Agree		2 Slightly Disagree		1 Disagree	
	F	%	F	%	F	%	F	%	F	%
Elevated pole to protect the great deluge (calamity)	45	60%	22	29.33%	8	10.67%	0	0%	0	0%
Wide/Thick pole and Good Foundation	12	16%	29	38.67%	30	40%	2	2.67%	2	2.67
Signs must be visible in the pole	18	24%	22	29.33%	27	36%	4	5.33%	4	5.33%
Put a lightning Rod in the Street Light to protect from Thunder Storms	15	20%	26	34.67%	15	20%	13	17.33%	6	8%
Put a barrier in alarm system	11	14.67%	21	28%	26	34.67%	9	12%	8	10.67%

Table 2 shows the Prevention of Solar Security Street Lights according to hands-on training techniques of the 5 out of 25 items in this questionnaire; in these protections, the highest weighted mean is Wiring must be inside the Electric Tube and Quarterly Inspection with 44%, Construct in a Makeshift way with 37.33%, and the lowest is Make it ideal to supply power and Change every parts in every 6 or 12 months with 30.67%. The result reveals that the respondents are in favor in the Prevention of Solar Security Street Lights.

Table 2
Prevention of Solar Security Street Lights

Prevention of Solar Security Street Lights	5 Strongly Agree		4 Slightly Agree		3 Agree		2 Slightly Disagree		1 Disagree	
	F	%	F	%	F	%	F	%	F	%
Wiring must be inside the Electric Tube (PVC Tube/Utility Tube)	33	44%	30	40%	10	13.33%	2	2.67%	0	0%
Construct in Makeshift way or Crude Workmanship	21	28%	28	37.33%	25	33.33%	1	1.33%	0	0%
Quarterly Inspection to ensure that it is still in Good Condition	17	22.67	33	44%	13	17.33%	8	10.67%	3	4%
Make it ideal to supply power for weather stations, emergency communications, traffic control	23	30.67%	22	29.33%	20	26.67%	9	12%	1	1.33%
Change parts every 6 or 12 months	16	21.33%	23	30.67%	18	24%	7	9.33%	11	14.67%

Table 3 shows the Problems Encountered of Solar Security Street Lights according to hands-on training techniques of the 5 out of 25 items in this questionnaire; in these protections, the highest weighted mean is Short Circuits of wiring connection with 58.67%, Installation of equuipment with 50.67%, Weak c=Camera Internet Protocol Connection with 37.33%, Calamity with 33.33%, and the lowest is Damaged Parts with 25.33%. The result reveals that the respondents are in favor in the Problems Encountered of Solar Security Street Lights.

Table 3
Problems Encountered of Solar Security Street Lights

Problems Encountered of Solar Security Street Lights	5 Strongly Agree		4 Slightly Agree		3 Agree		2 Slightly Disagree		1 Disagree	
	F	%	F	%	F	%	F	%	F	%
Short Circuits of wiring connection	44	58.67%	15	20%	14	26.67%	2	2.67%	0	0%
Installation of Equipment	11	14.67%	38	50.67%	21	28%	3	4%	2	2.67%
Weak Camera Internet Protocol Connection	24	32%	28	37.33%	18	24%	3	4%	2	2.67%
Calamity	17	22.67%	19	25.33%	25	33.33%	11	14.67%	3	4%
Damaged parts	19	25.33%	12	16%	19	25.33%	14	18.67%	11	14.67

Table 4 shows the Benefits of Solar Security Street Lights according to hands-on training techniques of the 5 out of 25 items in this questionnaire; in these protections, the highest weighted mean is Conserve Electricity with 57.33%, For Coverage purposes with 56%, Reduced Damage/Thefts with 49.33%, Improved Safety with 37.33%, and the lowest is Comfortable and feel safe with 36%. The result reveals that the respondents are in favor in the Benefits of Solar Security Street Lights.

Table 4
Benefits of Solar Security Street Lights

Benefits of Solar Security Street Lights	5 Strongly Agree		4 Slightly Agree		3 Agree		2 Slightly Disagree		1 Disagree	
	F	%	F	%	F	%	F	%	F	%
For Coverage Purposes	42	56%	20	26.67%	10	13.33%	3	4%	0	0%
Conserve Electricity	15	20%	43	57.33%	17	26.67	0	0%	0	0%
Comfortable and Feel safe	19	25.33%	27	36%	27	36%	2	2.67%	0	0%
Reduced Damage/Thefts	8	10.67%	37	49.33%	26	34.67	4	5.33%	0	0%
Improved Safety	12	16%	28	37.33%	24	32%	11	14.67%	0	0%

Table 5 shows the Uses of Solar Security Street Lights according to hands-on training techniques of the 5 out of 25 items in this questionnaire; in these protections, the highest weighted mean is 24/7 Security with 56%, Alert System with 45.33%, Provides the energy needed to illuminate the darkness with 44%, For announcement purposes with 33.33%, and the lowest is It is initially used in remote locations and disaster prone areas with 20.67%. The result reveals that the respondents are in favor in the Uses of Solar Security Street Lights.

Table 5
Uses of Solar Security Street Lights

Uses of Solar Security Street Lights	5 Strongly Agree		4 Slightly Agree		3 Agree		2 Slightly Disagree		1 Disagree	
	F	%	F	%	F	%	F	%	F	%
24/7 Security	42	56%	23	30.67%	8	10.67%	2	2.67%	0	0%
Alert System (Disaster Preparedness)	25	33.33%	34	45.33%	15	20%	0	0%	1	1.33%
Provides the energy needed to illuminate the darkness late into the night.	33	44%	27	36%	12	16%	1	1.33%	2	2.67%
For announcement purposes	23	30.67%	25	33.33%	17	22.67%	7	9.33%	3	4%
It is initially used in remote locations and disaster prone areas.	20	20.67%	20	20.67%	18	24%	9	12%	8	10.67%

CONCLUSION

Based on the findings, the researcher has arise at this conclusion.

Protection of Solar Security Street Lights, majority of the officials answered stongly agree to Elevated Pole with average of 60% on Solar Security Street Lights. *Prevention of Solar Security Street LightsMajority of the officials answered strongly agree that the wires or connections must be inside the pole or PVC Tube and Quarterly Inspection with an average of 44%.

Problem of the Solar Security Street Lights, majority of the officials answered strongly agree that weak Short Circuits must be our most problem in the Street Lights with an average of 58.67%.

Benefits of Solar Security Street Lights, majority of officials answered slightly agree with an average of 57.33% that Solar Security Street Lights can possibly more beneficiary for Conserve Electricity.

Uses of Solar Security Street Lights, majority of the officials answered strongly agree with an average of 56% that it can worked 24/7 full security.

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CHARGE DENSITY ANALYSIS OF CO MOLECULE ADSORPTION ON OS(0001) SURFACE

Hiromi Rivas

INTRODUCTION

Carbon monoxide (CO) adsorption on the surface of a metal has been of great importance in the study of reactions. As a gas, CO is odorless and harmful to living organisms [1]. The adsorption of CO molecule on a metal surface has been of great interest to the researchers because of its application in renewable energy. It is a vital process in CO oxidation, CO hydrogenation, and in the fuel cell technology, to name a few.

This study gives attention to the chemical bond between the Osmium surface and the C atom of the CO molecule. Previous literature showed that the CO molecule prefers to be adsorbed on the top site. To gain a simple picture of the process, investigation on the Osmium (0001) (which now referred to as Os(0001)) surface would be reasonable.

METHODOLOGY

COMPUTATIONAL DETAILS

This study used Density Functional Theory, and the calculations were done using the Vienna Ab Initio Simulation Package or VASP. For the exchange-correlation, this study used the Perdew-Burke-Ernzerhof (PBE) functional. Frozen core all-electron projector-augmented wave (PAW) method was employed in the calculations with spin polarization considered—a special k-point mesh of 9x9x1was employed in the Brillouin zone. The mesh was gamma-centered and generated by using the Monkhorst-Pack scheme. The kinetic energy cut-off of 400 eV for the plane-wave basis set was implemented. We also used the Methfessel-Paxton smearing method with sigma set to 0.2 eV. The electric charge analysis using Bader Charge analysis was used to determine the type of bond between the CO molecule and Os(0001) surface.

CO ADSORPTION ON Os(0001)

The Os(0001) slab was relaxed before the adsorption of CO molecule on its surface. The CO molecule was also relaxed and isolated before the adsorption process. The observed bond-length of CO was 1.14 Å, which agrees with the experimental value. The Os(0001) lattice constant also agrees with the existing experimental data. This study focuses only on the CO adsorption on the Os(0001). We investigated the top site adsorption of CO molecule to the Os(0001). The top site has less coordination number compared to other sites; therefore, this site gives better insights about the bond type of CO-Os system.

RESULTS AND DISCUSSIONS

The observed adsorption was comparable to the results obtained by other works that focused on late transition metals. The CO molecule preferred to be adsorbed in an upright manner with the carbon atom at the adsorbing side. Table 3.1 presents the results obtained

during the calculations. Initially, the Os, C, and O atoms have 8.05e, 3.30e, and 6.97e units of charges. As the CO molecule approached the surface of the Os(0001), the charges redistributed in such a way that the Os atom gained -0.20e units of charges. This amount of charge is less than 1 unit of charge, which corresponds to covalent bonding. The electron on the O atom also contributes partial charge transfer; however, this amount is minimal (0.01e).

Table 3.1

Atom	CO on Os slab	Isolated Os and CO	Charge Transfer
Os	7.84*e*	8.05*e*	-0.21*e*
C	3.27*e*	3.30*e*	0.24*e*
O	7.00*e*	6.97*e*	0.03*e*

Figure 3.1 shows the charge density difference (CDD) of the CO-Os system. The region in yellow represents the electron-rich part, while the blue-green region represents an electron-deficit part. The CDD indicates that the electron from the Os atom migrated to the region between CO and Os atom. The build-up of charge in this region and the partial charge transfer indicates covalent bonding.

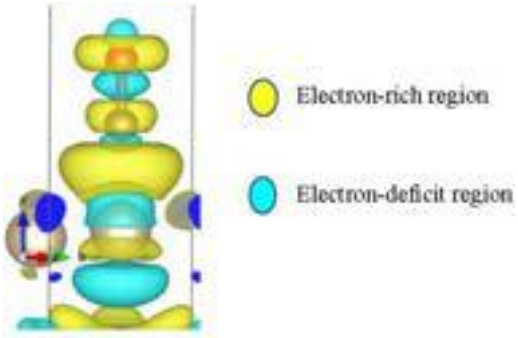

Figure 3.1. Charge Density Difference of CO-Os System.

CONCLUSION AND RECOMMENDATIONS

This work presents the charge transfer and redistribution of the electrons in the CO-Os system. The calculated charge transfer from the Os atom to C atom was only partial, and figure 3.1 suggests that the charges were redistributed in the region between Os Atom and C molecule.

For better gain complete insight on CO adsorption on Os(0001) surface, an investigation on other sites is recommended. The density of states (DOS) is also a good property to explore.

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A SUFFICIENT CONDITION FOR A GRAPH TO HAVE TWIN CHROMATIC INDEX EQUAL TO ITS MAXIMUM DEGREE

Jayson D. Tolentino

INTRODUCTION

Let $G = (V, E)$ be a simple graph. A *proper vertex coloring* of G is a function from V to a given set of colors such that adjacent vertices are colored differently. On the other hand, a *proper edge coloring* of G is a function from E to a given set of colors such that adjacent edges are colored differently. The minimum number of colors needed in a proper vertex coloring and a proper edge coloring are the *chromatic number* and the *chromatic index* of G and are denoted by $\chi(G)$ and $\chi'(G)$, respectively. Thus, $\chi(G) \leq \Delta(G) + 1$ and $\chi'(G) \geq \Delta(G)$, where $\Delta(G)$ is the maximum degree of G.

A relatively new kind of graph coloring that has been studied in literature is the twin edge colorings of graphs. This concept was introduced by Chartrand [5] and initially studied in [1 – 3].

Definition. For a connected graph G of order at least 3, a proper k-edge coloring $c: E(G) \to \mathrm{Z}_k$ for some integer $k \geq 2$ is called a twin k-edge coloring of G if the induced coloring $c': V(G) \to Z_k$ defined by

$$c'(v) = \sum_{e \in E_v} c(e) \text{ in } Z_k,$$

where E_v is the set of edges of G, incident with v, is proper as well. The minimum k for which G has a twin k-edge coloring is the *twin chromatic index* of G, denoted by $\chi_t'(G)$.

Since a twin edge coloring is a proper edge coloring $\chi_t'(G) \geq \Delta(G)$. It has been shown in [1] that every connected graph of order at least 3 has a twin edge coloring.

In [1], Andrews *et.al* obtained the twin chromatic indices of paths, cycles, complete graphs, and complete bipartite graphs. Based on their results in [1], they formulated the conjecture that the twin chromatic index of a graph G is at least its maximum degree and at most its maximum degree plus 2.

In this paper, we provide a sufficient condition for a graph to have twin chromatic index equal to its maximum degree. We discuss this in the following theorem.

RESULT AND DISCUSSION

The terms not defined in this paper can be found in [4].

Theorem. Let G be a connected graph that satisfies the following:

1. $\Delta(G) \geq 5$;
2. G is not a star;
3. $G \ncong S(n_1, \ldots, n_{\Delta(G)})$ where $n_i \leq 3$ for each $1 \leq i \leq \Delta(G)$ when $\Delta(G)$ is odd;
4. $G \ncong S(3,3, \ldots, 3)$; and
5. $d(u, v) \geq 4$ for any two distinct vertices u and v of G with $deg(u), deg(v) \geq 3$.

Then, $\chi_t'(G) = \Delta(G)$.

Proof. Let $\Delta(G) = m$. We will show that G has a twin m-edge coloring. First, we define an m-edge coloring $c^*: E(G) \to \mathrm{Z}_m$ as follows:

For each $u \in V(G)$ with $deg(u) \geq 3$, we define $c^*(E_u) = S \subseteq \mathrm{Z}_m$ such that each of the following conditions holds:

i. $|S| = deg(u)$;
ii. if $0 \in S$, then $c^*(ux) = 0$ for some $x \in N(u)$ that does not have a neighbor that is a leaf; and
iii. if $\sum_{s\in S} s \in S$, then $c^*(uy) = \sum_{s\in S} s$ for some $y \in N(u)$ that is not a leaf.

We note that, by condition (i), the edges incident with each u are colored differently. We now completely define c^* by letting $c^*(e) = 0$ for each edge $e \in E(G)$ whose end vertices have degrees at most 2.

If $G \cong S(n_1, \dots, n_m)$ where $n_i \leq 3$ for each $1 \leq i \leq m$, then $c^*(e) = c^*(e') = 0$ for some adjacent edges e and e' of G. If $G \cong S(n_1, \dots, n_m)$ where $n_i \leq 3$ for each $1 \leq i \leq m$, then m must be even and $n_i = 2$ for some $1 \leq i \leq m$. Therefore, $c^{*\prime}(v) = c^{*\prime}(z) = \frac{m}{2}$ for some adjacent vertices v and z of G (see example in Figure 1). Hence, the m-edge coloring c^* is not a twin m-edge coloring. However, we can use c^* to construct a twin m-edge coloring $c: E(G) \to \mathrm{Z}_m$ as follows:

Let $e_1, e_2, \dots, e_k$ be an ordering of all the edges of G whose end vertices have degrees at most 2, where $e_i = u_i v_i$ for $1 \leq i \leq k < |E(G)|$. We will define $k+1$ colorings $c_0, c_1, \dots, c_k$ inductively such that $c_i: E(G) \to \mathrm{Z}_m$ and $c_0 = c^*$. In order to define c_i, we first define the following sets: For $1 \leq i \leq k$, let

$$A_i = \{c_{i-1}(e) \mid e \; is \; adjacent \; with \; e_i\}$$
$$B_i = \{c'_{i-1}(w) - c'_{i-1}(w_i) \in \mathrm{Z}_m \mid w_i = u_i \; or \; v_i, \; w \in N(w_i) \backslash \{u_i, v_i\}\}.$$

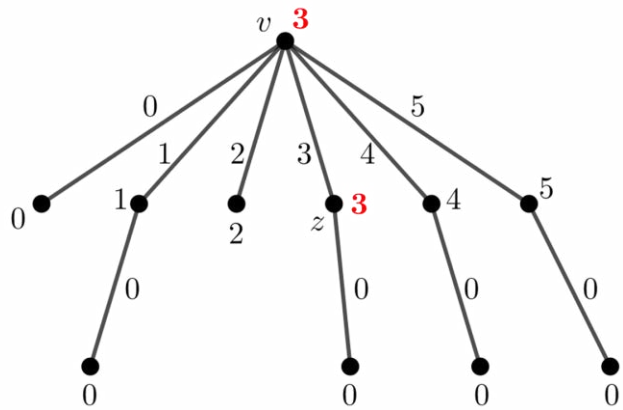

Figure 1. An improper vertex coloring of $S(2,3,2,3,3,3)$

We note that we can only define the sets A_i and B_i whenever the coloring c_{i-1} has been defined. Observe that

$$|A_i| \leq (deg(u_i) - 1) + (deg(v_i) - 1) \leq 2$$
$$|B_i| \leq (deg(u_i) - 1) + (deg(v_i) - 1) \leq 2.$$

Since $m \geq 5$, it follows that

$$|\mathrm{Z}_m - (A_i \cup B_i)| \geq 5 - (2 + 2) = 1$$

and so $\mathrm{Z}_m - (A_i \cup B_i) \neq \phi$.

Now, if $c_{i-1}: E(G) \to \mathrm{Z}_m$ has been defined for some i with $1 \leq i \leq k$, we define the coloring $c_i: E(G) \to \mathrm{Z}_m$ by

$$c_i(e) = \begin{cases} c_{i-1}(e) & if\ e \neq e_i \\ \min\{\mathrm{Z}_m - (A_i \cup B_i)\} & if\ e = e_i. \end{cases}$$

Claim : $c = c_k: E(G) \to \mathrm{Z}_m$ is a twin m-edge coloring of G.

Let $F = \{e_i \mid 1 \leq i \leq k\}$. First, we show that $c: E(G) \to \mathrm{Z}_m$ is a proper m-edge coloring of G. Let e and e' be any two adjacent edges of G. We will show that $c(e) \neq c(e')$.

Case 1: $e, e' \notin F$.

By the inductive definition of c, it follows that

$$c(f) = c_k(f) = c_{k-1}(f) = \cdots = c_2(f) = c_1(f) = c_0(f) = c^*(f) \quad \textbf{(1)}$$

where $f = e$ or e'. Since $e, e' \notin F$, $c(e) = c^*(e)$, $c(e') = c^*(e')$, and $c^*(e) \neq c^*(e')$; so $c(e) \neq c(e')$.

Case 2: $e \notin F$ and $e' \in F$.

Then $e' = e_j$ for some $1 \leq j \leq k$. Since $e \notin F$, by equation (1), $c(e) = c_{j-1}(e)$. Moreover, by the inductive definition of c, it follows that

$$c(e_j) = c_k(e_j) = c_{k-1}(e_j) = \cdots = c_{j+2}(e_j) = c_{j+1}(e_j) = c_j(e_j).$$

Since e and e_j are adjacent, $c_{j-1}(e) \in A_j$. By definition of c_j, $c_j(e_j) \notin A_j \cup B_j$. Therefore, $c_{j-1}(e) \neq c_j(e_j)$ and so $c(e) \neq c(e')$.

Case 3: $e, e' \in F$.

Let $e = e_j$ and $e' = e_l$, where $1 \leq j, l \leq k$. Without loss of generality, we let $j < l$. By the inductive definition of c, we have $c(e_l) = c_l(e_l)$ and $c(e_j) = c_{l-1}(e_j)$. But $c_{l-1}(e_j) \in A_l$. Therefore, $c(e_l) = c_l(e_l) \neq c_{l-1}(e_j) = c(e_j)$.

We now show that the induced vertex coloring $c': V(G) \to \mathrm{Z}_m$ is also proper. Let u and v be any two adjacent vertices of G. We show that $c'(u) \neq c'(v)$. Consider the degrees of u and v. Without loss of generality, let $deg(u) \geq deg(v)$.

Case 1: $deg(u) \geq 3$ and $1 \leq deg(v) \leq 2$.

Suppose $deg(v) = 1$. Then $c(uv) = c'(v)$. By definition of c^*, $c^{*\prime}(u) \neq c^*(uv)$. Since $deg(u) \geq 3$, by the inductive definition of c, $c(e) = c^*(e)$ for each $e \in E_u$ and so

$$c'(u) = \sum_{e\in E_u} c(e) = \sum_{e\in E_u} c^*(e) = c^{*\prime}(u) \neq c^*(uv) = c(uv) = c'(v).$$

Suppose $deg(v) = 2$. Then v is adjacent with e_i for some $1 \leq i \leq k$. Then $c'(v) = c(uv) + c(e_i)$. Now, assume on the contrary that $c'(u) = c'(v)$. Therefore, $c'(u) = c(uv) + c(e_i)$ and so

$$\begin{aligned} c'_{i-1}(u) - c'_{i-1}(v) &= \sum_{e\in E_u} c_{i-1}(e) - [c_{i-1}(uv) + c_{i-1}(e_i)] \\ &= \sum_{e\in E_u} c(e) - [c(uv) + 0] \\ &= c'(u) - c(uv) \\ &= c(e_i) \\ &= c_i(e_i). \end{aligned}$$

Recall that, by definition of B_i, we have $c'_{i-1}(u) - c'_{i-1}(v) \in B_i$. Therefore, $c_i(e_i) \in B_i$. But this contradicts the definition of the edge coloring c_i. Hence, $c'(u) \neq c'(v)$.

Case 2: $deg(u) = 2$ and $1 \leq deg(v) \leq 2$.

Observe that, in this case, $uv = e_i$ for some $1 \leq i \leq k$. Let $w \neq v$ be the other vertex of G that is adjacent with u.

Subcase 2.1: Suppose $deg(v) = 1$. Then $c(uv) = c'(v)$ and $deg(w) \geq 2$.

If $deg(w) \geq 3$, then $c(uw) = c^*(uw) \neq 0$. If $deg(w) = 2$, then $uw = e_j$ for some $1 \leq j \leq k$, where $i \neq j$. If $i < j$, then

$$\begin{aligned} c'_{j-1}(u) - c'_{j-1}(v) &= \left[c_{j-1}(e_j) + c_{j-1}(e_i)\right] - c_{j-1}(e_i) \\ &= \left[0 + c_{j-1}(e_i)\right] - c_{j-1}(e_i) \\ &= 0. \end{aligned}$$

By definition of B_j, $0 = c'_{j-1}(u) - c'_{j-1}(v) \in B_j$. If $j < i$, then $c_{j-1}(uv) = 0$ and so $0 \in A_j$. Therefore, in any case, $0 \in A_j \cup B_j$ and so $c(uw) = c(e_j) = c_j(e_j) \neq 0$. Hence, $c'(u) = c(uw) + c(uv) \neq c(uv) = c'(v)$.

Subcase 2.2: Suppose $deg(v) = 2$.

Then $|E_u \cup E_v| = 3$. Let $x \neq u$ be the other vertex of G that is adjacent with v. Then we have $E_u \cup E_v = \{uw, uv, vx\}$. Since $d(z, z') \geq 4$ for each pair of vertices $z, z' \in V(G)$ with $deg(z), deg(z') \geq 3$, at least one of the vertices w and x has degree at most 2. Therefore, at least two of the elements in $E_u \cup E_v$ are elements of F. To show that $c'(u) \neq c'(v)$, we just need to show that $c(uw) \neq c(vx)$. Among the edges in $E_u \cup E_v$, let e_i be the one having the largest subscript i.

Suppose $e_i \neq uv$. Without loss of generality, we let $e_i = uw$. Then

$$\begin{aligned} c'_{i-1}(v) - c'_{i-1}(u) &= [c_{i-1}(uv) + c_{i-1}(vx)] - [c_{i-1}(e_i) + c_{i-1}(uv)] \\ &= c_{i-1}(vx) - c_{i-1}(e_i) \\ &= c_{i-1}(vx) - 0 \\ &= c_{i-1}(vx). \end{aligned}$$

This means that $c_{i-1}(vx) \in B_i$ and so $c_i(e_i) \neq c_{i-1}(vx)$. Therefore, by the inductive definition of c, we have

$$c(uw) = c(e_i) = c_i(e_i) \neq c_{i-1}(vx) = c(vx).$$

Suppose $e_i = uv$. Let e_j be the edge in $E_u \cup E_v$ such that j is the second largest subscript (used in $E_u \cup E_v$). Without loss of generality, we let $e_j = uw$. Since $j - 1 < j < i$, $c_{j-1}(e_j) = 0 = c_{j-1}(e_i)$. Then $c'_{j-1}(u) = c_{j-1}(e_j) + c_{j-1}(e_i) = 0$ and $c'_{j-1}(v) = c_{j-1}(vx) + c_{j-1}(e_i) = c_{j-1}(vx)$. Therefore, $c_{j-1}(vx) = c'_{j-1}(v) - c'_{j-1}(u) \in B_j$ and so $c_j(e_j) \neq c_{j-1}(vx)$. Hence, $c(uw) = c(e_j) = c_j(e_j) \neq c_{j-1}(vx) = c(vx)$.

Therefore, our claim is true, that is, c is a twin m-edge coloring of G. Hence $\chi'_t(G) = m = \Delta(G)$.

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PAGMAMAPA NG MGA PAGSASALING NG MGA GRADWADONG MAG-AARAL NG UNIBERSIDAD NG PILIPINAS TUNGO SA PAGBUO NG REKOMENDASYONG TALA NG PAGSASALIN SA EARIST

Rosario Unisa
Esperanza Villena
Adrian Calimlim

INTRODUKSYON

Noon pa man ay may ilan ng mga dalubwika na nagpakita ng inisyatibo hinggil sa pag-iintelektwalisa ng ating wikang pambansa. Isa na riyan ay si Dr. Bonifacio Sibayan (1985) na nagsagawa ng isang pagpaplanong pangwika. Layunin nang nasabing plano na magsilbing batayan o referensiya sa proseso ng intelektwalisasyon ng ating pambansang wika. Ang planong ito ay di lubusang naging matagumpay. Isa sa mga nakitang kahinaan nito ay ang kawalan ng importansya sa larang ng pagsasalin. Kaya naman sa susunod na taon, sa gaganaping pambansang kumperensiya ng pagpaplanong pangwika (na pangungunahan ng KWF at ilan pang mga institusyon), binigyang puwang na ang kahalagahan ng pagsasalin bilang tulay sa minimithing intelektwalisadong wikang Filipino. Isinama nila ang pagsasalin bilang isang mahalagang agenda na kanilang pag-uusapan.

Kaugnay nito, ayon nga kay Almario (2017) “kinakailangan sa gaganaping pagpupulong na ito ay mailatag ng bawat unibersidad ang kanilang mga pag-aaral sa pagsasalin nang sa gayon ay makita ang naging papel nila at magiging papel pa sa pagpapayabong ng Wikang Filipino.”

Sa tagpong ito pumapasok ang pananaliksik na ito, nilayon ng mga mananaliksik na maipakita ang kontribusyon ng Unibersidad ng Pilipinas (bilang isang nangungunang institusyon sa pag-iintelektwalisa ng wikang Filipino) sa larang ng pagsasalin. Ninanais ng mga mananaliksik na makabuo ng isang data based research ng mga pagsasalin sa unibersidad na ito na siyang magagamit nila sa gaganaping kumperensiya sa susunod na taon. Layon din ng mga mananaliksik na makabuo ng isang sistematikong listahan ng mga paksa na maaaring isalin ng mga mag-aaral na gradwado na kumukuha nang nasabing kurso.

MGA TIYAK NA LAYUNIN SA PAG-AARAL

Nilalayon ng pag-aaral na ito na:

1. Maitala ang mga naisagawang pag-aaral sa larang ng pagsasaling-wika sa UP.

2. Matukoy ang mga paksa ng pag-aaral na ukol sa pagsasalin na naisagawa sa UP.

3. Makabuo ng isang rekomendasyong listahan ng mga paksang maaaring isalin ng mga mag-aaral sa Filipino ng EARIST

METODOLOHIYA

Ang mga mananaliksik ay gumamit ng isang deskriptibong pamamaraan upang ilarawan ang mga paksang namamayani sa larangan ng pagsasalin sa mga pananaliksik na naisagawa sa Unibersidad ng Pilipinas. Inihanay ng mga mananaliksik ang mga nagawang pananaliksik sa pamamagitan ng isang talahanayan batay sa mga sumusunod na detalye:

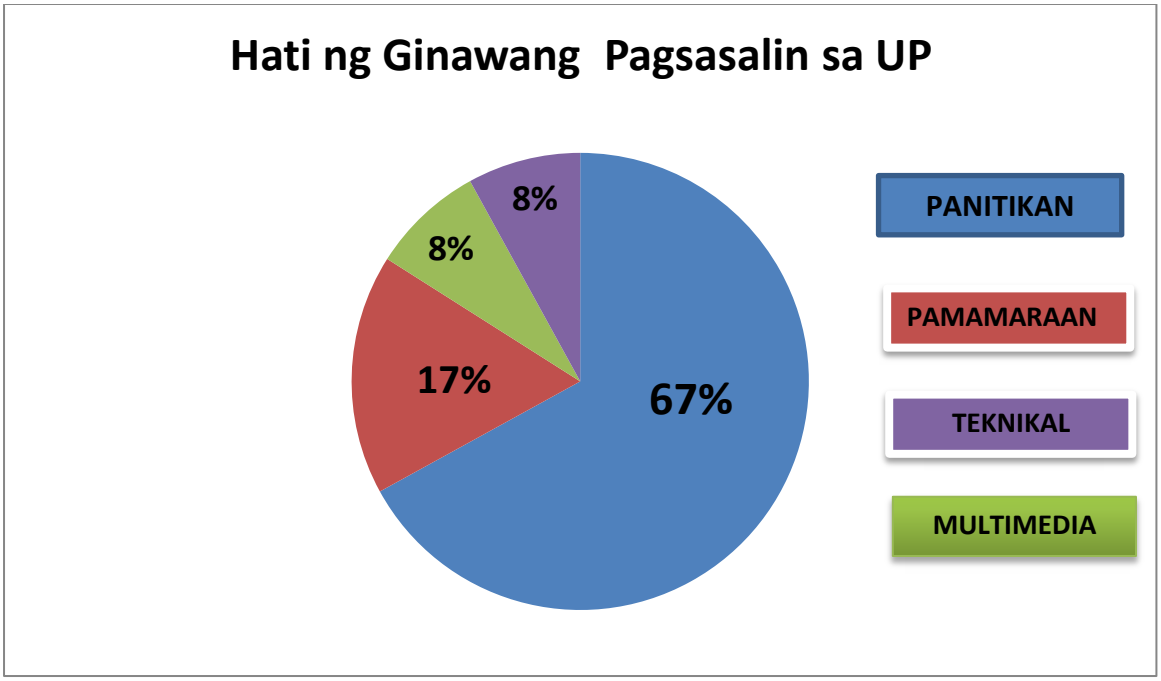
(1) Taong Nailathala ang Pananaliksik
(2) Pamagat at Mga Mananaliksik
(3) Mga Layunin
(4) Mga Ambag ng Pananaliksik

Taon	Pamagat	Mananaliksik	Paksa	Layunin	Mga Ambag
1987	Pagsasakatubo sa Pagsasalin: ang nilalaman at pamamaraan ng pagsasalin ng nobela sa panahon ng kolonyalismong Amerikano, 1912 – 1940	Lilia F. Antonio	Pamamaraan sa Pagsasalin - Pagsasakatubo	Mailahad ang naging pangunahing paksain at pamamaraan ng pagsasalin ng nobela sa panahon ng kolonyalismong Amerikano	Data ng mga ginawang pagsasalin ng nobela sa panahon ng kolonyalismong Amerikano
1990	Kasaysayang Bilang Panitikan: Pagsasalin at Ebalwasyon ng The Forest (Ang Gubat) ni William J. Pomeroy	Rogelo Sicat	Pagsasalin sa Panitikan (Ilocos Sur) SW: Ingles/Ilokano TW: Filipino	Maipakilala ang The Forest, ngayo'y nasa Wikang Filipino bilang isang rekord na pang kasaysayan ng rebolusyon ng mga magsasaka, at pagpapakilala rin sa awtor bilang mahalagang manunulat ng kasaysayang at panitikan ng Pilipinas.	Naipakilala ang nobela ng The Forset bilang record ng kasaysayan sa rebolusyon ng mga magsasaka.
Abril, 1993	PANAGIYULOG: Tungo sa Pagbubuo ng Isang Teoryang sa Pagsasalin (Maikling Kwento Iloko sa Filipino)	Ofelia B. Jamilosa-Sillapan	Pagsasalin sa Panitikan (Ilocos Norte) SW: Ilokano TW: Filipino	Makabuo ng isang teorya ng pagsasalin sa Filipino mula sa sang katutubong wika sa Pilipinas.	Isang teorya na magiging lunsaran sa gagawing pagsasalin mula Ilokano tungo sa Filipino
Marso, 1998	Mapanuring Paglilimbag: Isang Pagsasalin at Pagsusuri ng Historia dela Insurrecion Filipina en Cavite ni Don Telesforo Canseco, 1987	Jose Rhommel B. Hernandez	Pagsasalin sa Panitikan SW- Kastila TW – Filipino	Maipakilala si Telesforo Canseco at ang kanyang naging gampaning papel sa rebolusyon ng Cavite	Ang kahalagahan ng Historia bilang batis sa pagtalunton sa kasaysayan ng rebolusyon ng mga Pilipino.
Mayo, 2004	Pagsusuri at Pagsasalin ng mga Sarswela ni Justiniano Nuyda, 11920-1928	Odessa N. Joson	Pagsasalin sa Panitikan (Bicol Region) SW: Bikolano TW: Filipino	Layunin nitong: Ano-ano at paano nagkaroon ng mga Kontradiksyon sa lipunang Bikolano noong 1920. Ano-ano ang mga	Maitawid ang panitikang Bikol sa mga mambabasa at maalis sa laylayan ng panitikan sa Flipino.

				magkasalungat magkakatunggaling senyal na nakapaloob sa dula? Ano-ano ang mga talinghagang lumtaw sa dula ni Nuyda na nagpapakia ng pagharap sa kontradiksyon?	Tinangkang ipasok sa mainstream ang wika at panitikang Bikol. Litaw na naipakita sa mga sarswela ang bahd ng impluwesnya ng Amerikano.
Oktubre, 2005	"Pagbabalik sa Pinaghasikang Linang" Pagbuo ng Isang Modelo ng pagsasaling kultural batay sa sarsaritang pangkanayunan ni Manuel E. Arguilla	Florentino A. Iniego, Jr.	Pagsasalin sa Panitikan (Ilocos Sur) SW: Ingles TW: Filipino	Maisalin ang dalawang sarita ni MEA mula Wikang Ingles tungkol sa Wikang Filipino ambag sa pagtatanghal ng rehiyunal na panitikan sa pambasang panitikan. Matalakay ang pangangailangan malagpasan ang limitasyon ng wikang Ingles tungo sa mabisang paglalarawan ng buhay, dia at kulturang Iloko na matatagpuan sa mga akda ni MEA. Magpanukala ng isang modelo ng pagsasaling kultural na umaangkop sa paglalarawan ng buhay kultura at Wikang Iloko.	Isang ambag upang patunayan ang kakayahan ng wikang Filipino na pag-uugnay-ugnayin ang diberesidad ng buhay, wika, at kultura mula sa mga rehiyon tungo sa landasan ng pagbubuo ng pambansang panitikan. Isa itong paglingon at paglilikom sa mga nasimulang karanasan at panukala ng mga tagaasalin ng mga akdang rehiyunal.
Mayo, 2007	Mga Zarzuelang Pangasinan nina Pedro U. Sison na "Korang na Panaon" at Nazario D. Soriano na "Baliti" at "Calvariod Paraiso": ISang Pagsasalin	Rosalinda A. Mendigo	Pagsasalin sa Panitikan (Pangasinan) SW: Pangasinense TW: Filipino Pamamaraan: Social Semiotic	Isinalin mula sa wikang Pangasinense tungong wikang Filipino at pag-aralan at suriin ang mga nabanggit na zarzuela.	Naging daluyan ang saling teksto para sa diskurso ng pagpapanayam ng panitikang pambansa. Natukoy ang mahahalagang batayan at resulta ng pagkakaunawa

					ng bawat indibidwal sa zarzuela.
Oktubre, 2008	Ang Pagsasalin ng Agham Pampulitika Tungo sa Intelektwalisasyon ng Wikang Filipino	Ma. Norma Q. Tuazon	Pagsasaling Teknikal SW – Ingles TW – Filipino	Magsalin ng teksbuk ukol sa agham pampulitika na nasa anyong simple at madaling basahin	Salin ng mga teknikal na teksbuk sa Filipino

KINALABASAN NG PAG-AARAL



1. Maitala ang mga naisagawang pag-aaral sa larangan ng pagsasaling-wika sa UP.

Ang mga mananaliksik ay nakalikom ng 12 pag-aaral ukol sa pagsasalin na ginawa ng mga gradwadong mag-aaral. Makikita sa p. 4 – 13 ang kabuuang detalye ng mga pag-aaral na nalikom.

2. Matukoy ang mga paksa ng pag-aaral na ukol sa pagsasalin na naisagawa sa UP.

Sa ginawang paglikom ng mga mananaliksik, napag-alaman nila na ang karaniwang paksa ng pananaliksik ng mga gradwadong mag-aaral ay ang sumusunod:

a. Ang kalimitang paksa ng pag-aaral ukol sa pagsasaling wika ay ang pagsasalin ng panitikan (Rehiyunal at Asyanong panitikan), multimedia (banyagang dramang pantelebisyon) at teknikal tulad ng sayantipikal na pag-aaral.

b. Sa pamamaraan sa pagsasalin, kalimitang inilapat ang pragmatiko, dekonstruksyon, semantikal, hambingang salin at social semiotics na pamamaraan.

c. Sa nalikom na salin, nasa ibaba ang ilang mga wikang ginamit bilang simulating wika at tunguhing wika:
Simulaing Wika: Ilokano, Pangasinense, Kastila, Tsino, Ingles, Ibanag, Bikolano.
Tunguhing Wika: Filipino, Ingles.

3. Makabuo ng isang rekomendasyong listahan ng mga paksang maaaring isalin ng mga mag-aaral sa gradwadong antas.

Sa kabuuan, mayroong 15 pag-aaral ukol sa pagsasalin ang nalikom ng mga mananaliksik. 9 rito ay panitikan, 3 ay sa pamamaraan, 1 sa multimedia at 2 rin naman sa teknikal na aspeto. Kaugnay sa nalikom na pag-aaral na ito, naging batayan ito ng mga mananaliksik upang bumuo ng isang rekomendasyong listahan ng mga tiyak na paksa na maaaring isalin ng mga gradwadong mag-aaral ng UP.

Nasa ibaba ang nabuong rekomendasyong listahan ng mga mananaliksik:

Tema ng Pananaliksik	Tiyak na Paksa
PANITIKAN	Global na Panitikan: Amerika, England, France, Germany at iba pang mga bansa sa kanluranin. Uri ng Akda: Tula, Sanaysay, Epiko, Nobela, Dula, Maikling Kwento, Pabula, Alamat
Teknikal	• Mga Batayang Aklat sa Elementarya, Sekundarya, Tersarya ry na sa asignaturang Matematika, Agham, Bokasyunal at iba pang sabjek na ang midyun ng pagsulat ay nasa Ingles. • Mga Sayantipikal at Matematikal na Pag-aaral. Hal: sa larang ng *Biology, Chemistry*, *Physics, Calculus* atbp. • Mga Teknikal at Bokasyunal na Pag-aaral: Hal: sa larang ng Kompyuter, Makina, at *Engineering* • At iba pang teknikal na teksto Hal: student handbook, journal, mga fill-up form ng kumpanya atbp.
MULTIMEDIA	• Mga rehiyunal na dramang panradyo at pantelebisyon • Mga Asyano at kanluraning dramang panradyo at pantelebisyon
PAMAMARAAN	• Komunikatibo • Idyomatiko • Teknikal • Malayang Salin

KONGKLUSYON

Batay sa kinalabasan ng pag-aaral, ang mga mananaliksik ay nakabuo ng kongklusyon na:

1. Bagamat may kursong “Pagsasalin” sa antas gradwado ng Unibersidad ng Pilipinas, kakaunti lamang ang mga pag-aaral na ukol sa pagsasalin ang ginagawa ng mga gradwadong mag-aaral nito.

2. Kalimitan na “Panitikan” ang paksa ng pagsasalin ng mga gradwadong mag-aaral, at ito’y nakapokus lamang sa rehiyunal at asyanong panitikan. Ang “Teknikal” at

"Multimedia" naman ang siyang pinakamadalang na paksa na gawan ng pag-aaral na pagsasalin. Karaniwan namang Ingles at Filipino ang wikang ginagamit ng mga nagsasalin.

3. Ang nabuong rekomendasyong listahan ng mga mananaliksik ay nakabatay sa mga paksang hindi naging saklaw ng pag-aaral ng mga gradwadong mag-aaral sa Unibersidad ng Pilipinas.

REKOMENDASYON

1. Magbigay ang Unibersidad ng Pilipinas sa mga gradwadong mag-aaral ng tulong pinansyal upang maisakatuparan nila at mailathala ang anumang pag-aaral na nauukol sa pagsasalin.

2. Magkaroon ng kowta ng bilang ng mga pagsasalin na ang paksa ay "Panitikan". Himukin ang mga gradwadong mag-aaral na magsalin ng isang panitikan gamit ang mga rehiyunal na wikang sinasalita sa ating bansa.

3. Maaari ring gumawa ng isang data based na nakapokus naman sa ibang erya ng Filipino tulad ng komunikatibo, kagamitang pampagtuturo, estruktura ng wika, atbp. Makatutulong ito upang makabuo ng mga rekomendasyong listahan ng mga paksa na maaaring gawan ng pag-aaral, na siyang magiging daan naman upang mapalawak pa ang kaalaman sa mga eryang nabanggit.

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Behavioral
Research

AN ASSESSMENT OF ENGLISH PROFICIENCY OF THE SECOND YEAR HIGH SCHOOL STUDENTS AS PERCEIVED BY THE TEACHERS OF THE DIVISION OF TAYTAY RIZAL

Rommuel E. Abanto
Daisy Bongtiwon

INTRODUCTION

Any language is very contextually driven. While it is also interactive dependent, it is possible to be able to read and not comprehend what was read. Which is why it is important to assess discreetly, as well as holistically.

In our globalized world, language education is of great importance because it is the mainstream of curriculum. For the past years, we saw the emergence of important trends in the field of second language teaching. These have been transmitted globally and proven to have influenced the learning of English in many countries of the world including the Philippines. Language is used as an international tool and teaching English is becoming an educational field that is worthwhile exploring if transmitted successfully.

It is also believed that learning English and learning it well are of prime importance. We can acknowledge that the first importance of learning English language is that it is a means to communicate in the interconnected and independent world.

Another importance of the language is that it creates a greater opportunity for a job. It cannot be denied that English is the language of communication in some government, in international business, in different professions and in many aspects of the lives of the people of the world. As we know, businesses today are targeting at quantities of employees; and knowing English and good at it, we will have more chances to get a job. Moreover, with an enough amount of knowledge in English, the possibility of promotion in position is even higher.

However, recent language test results released by the Integrated Data Processing Education Property Limited Philippines, an accredited group that administers the International English Language Testing System (IELTS) to Filipinos seeking to work and migrate abroad, showed that the Philippines is no longer the top English - speaking country in Asia. With an overall score of 6.71, Malaysia is now the No.1 in English Proficiency in Asia. The Philippines placed only second with 6.69, followed by Indonesia (5.99), India (5.79) and Thailand (5.71). This was gleaned from IELTS results in 2008, during which some 35,000 Filipinos – 70 percent of them nursing graduates applying for jobs abroad – took the language exam to evaluate their English Proficiency in reading, writing, speaking, and listening.

It is therefore claimed that students' poor command of English language and instruction depends upon the competence in the teaching profession and is a matter of the mastery of the subject and the ability to impart the lesson to the students.

The teacher, therefore, as the key factor in language should be fully aware of the fact that his/her performance and approach are of great importance for the student and if he/she is not able to perform with competence in the classroom, what actually occurs inside the classroom and what the students see of their mentors in the classroom, are but the end results of the preparations she has undergone and of the expertise she may have gained and on which she relies upon in the management of her class.

Due to the problems encountered in the field of teaching – learning process, the researcher undertake this investigation to assess the level of English proficiency skill of the second year high school students of the Division of Rizal.

MATERIALS AND METHODS

This chapter will dwell on how the study will be undertaken. This will include among others, the research method and discussion of the research design, sources of data, procedures on gathering data, sampling techniques and relevant information from the respondents.

RESEARCH METHOD AND DESIGN

In order to attain the objectives and the main purpose of this study, the researcher intends to adopt the descriptive method of research as proposed where in the data were gathered in the form of questionnaire. This is a set of printed or written questions with a choice of answers, devised for the purposes of a survey or statistical study and which are appropriate according to the statement of the problem.

The data were presented, discussed, interpreted and analyzed using the descriptive method.

POPULATION AND SAMPLE SIZE

The researcher conducted her study at the Secondary School Division of Taytay Rizal. The respondents of this study were composed of thirty five teachers (35) ideally both male and female selected randomly. The sampling design used was random sampling using the fish bowl technique.

In this method, using questionnaire as the main tool to assess the English proficiency of the students, the researcher asked permission from the main authority to conduct her study composed of thirty five (35) representing population of the teacher respondents.

RESEARCH INSTRUMENT USED

In this study, the researcher used a main tool which is the survey questionnaire in forming and gathering the data needed. The questions are divided into three (3) parts. Section 1, this presents the profile of the respondents such as the age, gender, length of service, and specialization. Section 2, presents the questionnaire in the assessment of the students English proficiency. The Likert and arbitrary scale for Part II will be “Hardly Needed” with a corresponding Likert of 5 and Arbitrary scale of 4.50 – 5.00; “Very Much Needed” with a corresponding likert of 4 and Arbitrary scale of 3.50 – 4.49; “Much Needed” with a corresponding Likert of 3 and Arbitrary scale of 2.50 – 3.49; “Considerably Needed” with a corresponding Likert of 2 and Arbitrary scale of 1.50 – 2.49; “Not Needed” with a corresponding Likert of 1 and Arbitrary scale of 1.00 – 1.49. And the last part is the suggestions and recommendations of the respondents to help solve the problems with regards to the English proficiency skills of the students.

The questionnaire was drafted thru extensive reading of the researcher of various books and English materials, visitation into the library and browsing by the use of technology such as searching into websites. All parts of the questionnaire were patterned accordingly that deals with all aspects of the study in finishing the proper questionnaire.

The questionnaire was administered to the third and fourth year teachers for validation. It was shown to the English teachers for grammatical corrections and was also shown to the Editor for further comments, criticism and suggestions. Before the final draft of the questionnaire, the researcher produced some copies for the respondents. Upon final approval by the English editor, the questionnaire was distributed to the teacher respondents for their assessment on the English proficiency of the second year high school students in the four (4) major areas of English communication.

STATISTICAL TREATMENT OF DATA

The researcher used the following statistical tools for the interpretation and analysis of the data gathered in the survey:

1. Percentage, Ranking and Frequency Distribution – This is used to determine the percent equivalent of the number of respondents.

2. Weighted mean – This is a measurement of central tendency. It represents the average of a given data. Weighted mean is similar to arithmetic mean or sample mean. This is calculated when data is given in a different way than in arithmetic mean

The Rating Scale - the level of the respondents' response were determined by verbal interpretation to the computed weighted mean using Likerts' 5 point scale as illustrated in the table below:

Ranges	Scale	Verbal Interpretation
4.50 – 5.00	5	Hardly Needed
3.50 – 4.49	4	Very Much Needed
2.50 – 3.49	3	Much Needed
1.50 – 2.49	2	Considerably Needed
1.00 – 1.49	1	Not Needed

ANOVA (Analysis of Variance)

The One-Way ANOVA procedure produces a one-way analysis of variance for a quantitative dependent variable by a single factor (independent) variable. Analysis of variance is used to test the hypothesis that several means are equal. This technique is an extension of the two-sample t test.

The Rating Scale

The level of the respondents response was determined by verbal interpretation to the computed weighted mean using Likerts' 5 point scale

Option	Verbal Interpretation	Scale
5	Hardly Needed	5.0 - 4.49
4	Very Much Needed	4.5 - 3.49
3	Much Needed	3.5 - 2.49
2	Considerably Needed	2.5 - 1.49
1	Not needed	1.5 - 1.00

The treatment of data basically included the following:

a. Scoring and computation of the weighted averages

b. Use of frequency distribution, the percentage (5) and corresponding ordered of ranking. The highest frequency, percentage and the first in rank indicated the norm.

RESULTS AND DISCUSSION

This focuses on the analysis, interpretation and presentation of data. The data obtained from the survey questionnaire given by the respondents are the source of information for this research.

RESPONDENTS OF THE STUDY

1. PROFILE

1.1 GENDER

It showed that from the total respondents of 35; 82.86% was gathered with 29 frequency for female while there was only 17.14% for the 6 frequency under male category.

1.2 AGE

It showed that out of the total respondents of 35, 11 or 31.43% belong to 20-27 year old group range followed by 10 or 28.57% age group range belonging to 28-35 year old respondents. Next is 8 or 22.86% belonging to 44 and above year old category. Lastly, 6 or 17.14% belonging to the 36-43 year old age group.

1.3 LENGTH OF SERVICE

For the frequency and percentage distribution of table 1.3 pertaining to the length of service of the respondents, 22 or 62.86% with the 1-2 year length of service got the highest percentage, followed by 9 or 25.71% for the 3-4 year length of service category. The last is 4 or 11.43% for the 5 years and above length of service.

1.4 SPECIALIZATION

The specialization under Science has 42.86% for 15 frequency as the highest while English is in the second rank with 37.14% for 13 frequency. The succeeding rank went to Math specialization with 14.29% for 5 frequency and the specialization for History and Computer are parallel to each other with only 2.86% for only 1 frequency.

2. ASSESSMENT

2.1 ENGLISH PROFICIENCY SKILLS

2.1.1 LISTENING

In general, the WM of the English proficiency for the listening skill of the second year high school students, the overall weighted mean(WM) is 3.98 or Very Much Needed. The highest WM of 4.29 is needing to improve their skills to listen with understanding to a set of instruction. Followed by 4.26 WM for rules and

regulations. Next is 4.23 WM for a report of an emergency situation. The mathematics or science problem follows next with 4.11 WM, next is 4.09 WM directions by a person. An announcement comes next with a 4.0 WM. A weather report over the radio or TV, and a message both got a 3.94 WM. The 3.83 WM is the same for newscast by a reporter, a request, and an opinion/comment. 3.71 WM comes next with an account of a personal problem. Lastly is 3.69 WM for an offer.

2.1.2 SPEAKING

The overall Weighted Mean (WM) of the English proficiency for the Speaking skills of the second year high school students is 4.0 or Very Much Needed. The highest WM is 4.49 for answering questions followed by 4.37 WM for reporting orally, next is asking a question with a 4.17 WM. Participating in a conversation/group discussion got 4.03 WM. Relaying a message is next with 3.97 WM. Followed by 3.94 WM for conducting a meeting. Next is transacting business over the counter with 3.69 WM. Lastly is 3.51 WM for using the telephone or the radio.

2.1.3 READING

As proven, the Reading Proficiency Skills is definitely Very Much Needed as the overall mean result of 4.07 Weighted Mean (WM) for the survey result towards the reading proficiency skills of the second year high school students. To enumerate, the results from the highest are Interpret instruction/direction correctly (4.31 WM); recall ideas directly stated in the material read (4.29 WM); pick out specific details to get the main idea and read quickly to get the important idea or the message of a selection (4.26 WM); draw conclusions/ make generalizations from what is read and identify what is given/ what is asked in a mathematics problem or what is to be proven in an experiment (4.23 WM); differentiate facts from opinions (4.17 WM); reorganize ideas or information read (4.11 WM); choose the meaning of a word that fills the sentence and criticize ideas or information read (4.09 WM); interpret headlines/editorials of newspaper/magazine and predict outcomes from incidents read, and interpret graphs, tables, charts and ads (4.06 WM); read rapidly for specific details such as for a date, a name, a place or a reason for something (4.03 WM); use the parts of a book with ease and facility (4.00 WM); get meanings of a word by looking at its parts and note cause and effect relationships (3.97 WM); use the card catalogue with ease and facility (3.86 WM); make guesses about time and place (3.83 WM); and lastly, guess something from what is read (3.66 WM).

2.1.4 WRITING

It showed that the Very Much Needed is the result as the overall Weighted Mean of 4.04 starting from the highest rank in the summary of something to read with 4.26 WM while writing an organize outline of ideas and business letter are parallel for 4.17 WM; a set of direction for someone to follow has 4.11 WM followed by 3 categories with the same WM of 4.00 are announcement of school or community activity, a personal reaction to something said or read and a paragraph showing the message/details supporting it.

Meanwhile writing a description of something for a person, place, event or an idea has 3.97 WM followed by writing an anecdote with 3.94 WM while a poster

for school community activity has 3.91 WM and 3.86 WM as the last score in the rank is for a speech appealing to people regarding a school or community problem.

3. TEST

3.1 GENDER

It indicated that the test for significant difference between the gender of teacher - respondents towards their mean assessment with the English proficiency of second year high school students. The decision is to reject the null hypothesis (there is no significant difference between the gender of the respondents towards their mean assessment with English Proficiency) if the p-value is less than or equal to the 0.05 level of significance. As shown in the table, with p-value of 0.965, we do not reject the null hypothesis, since p-value is greater than the 0.05 level of significance. Hence, at 5% level of significance, we have insufficient evidence to conclude that there exists a significant difference between the gender of teacher - respondents towards their mean assessment with the English proficiency of second year high school students.

3.2 SPECIALIZATION

It presented the ANOVA (One-way Analysis of Variance) test which determines if a significant difference exists between the mean assessment of the teacher respondents with the English proficiency of the second year high school students when grouped according to their field of specialization. Significant difference is said to be present among variables if the p- value is less than or equal to the level of significance (0.05).

It can be observed from the table that the p-value (.759) is greater than the level of significance ($\alpha = 0.05$), we retain the null hypothesis, thus, we have insufficient evidence to conclude that there is a significant difference between the mean assessment of teacher respondents with the English proficiency of the second year high school students when grouped according to their specialization.

3.3 AGE GROUP

The appearance using the ANOVA (One-way Analysis of Variance) test will determine if there is a significant difference exists between the mean assessment of teacher respondents with the English proficiency of the second year high school students when grouped according to their age. The proclamation is not to reject the null hypothesis that there is no significant difference between the two variables because the p-value is greater than the 0.05 level of significance.

As shown in the result of the table presentation, the p-value of (.822) is larger than our required level of significance ($\alpha = 0.05$) in order to reject the null hypothesis. Therefore, we have unsatisfactory evidence to conclude that there is a significant difference in the study.

3.4 LENGTH OF SERVICE

There is no evidence in Table 3.4 to conclude if there is a significant difference exists between the mean assessments of teacher respondents with the English proficiency of the second year high school students– when grouped according to their length of service. Significant difference is said to be present among variables if the p-value is less than or equal to the level of significance (0.05).

From the ANOVA (One-way Analysis of Variance) test which determines the said question, it is reflected not to reject the null hypothesis (there is no significant difference between the two variables) because the p-value is higher than the 0.05 level of significance. The p-value should be less than or equal to the 0.05 level of significance in order to reject the null hypothesis.

Therefore, the p-value gathered in the table representing .362 which is greater than our level of significance (α = 0.05), thus, we failed to reject the null hypothesis.

CONCLUSIONS

From the cited findings, following conclusions are made:

1. The teacher respondents from the Division of Taytay Rizal are female-dominated schools, generally between 20-35 years old, in the prime of their lives, educationally qualified, major in the different areas of specialization, specifically using English as a medium of instruction and had served for more or less 1 to 5 years.

2. There is no significant difference between the male and female teacher respondents in their mean assessment of the English proficiency of the second year high school students.

3. As proven in the result, there is no significant difference in terms of length of service of the respondents in their assessment of the students English proficiency skills.

As shown in the tabular results, there is no significant difference in the mean assessment of the respondents in terms of their field of specialization into their assessment of the students English proficiency skills. Likewise, parents and teachers should work hand in hand to help students improve their English skills in the four (4) major areas of English communication.

Based on the findings and conclusions the following recommendations are drawn.

1. Teacher should encourage parents to introduce and expose their children more to various reading books/materials.

2. Parents and teachers should perhaps designate a certain amount of time each day for speaking only in English. One of the most important aspects of gaining proficiency in any language is speaking it regularly.

3. Students should be motivated to join a club dedicated to learning English. This can accelerate learning and can enhance their English skills.

4. Reading news articles at English news websites is a way to work on reading comprehension. On line learning is one tool to improve English literacy. The internet is one of the best places to go to improve vocabulary since definitions can be looked up easily with a simple web search.

5. Parents should advise their children to avoid watching dubbed films in favor of those with English voice and subtitles. Watching or listening to media in English is a way to improve English comprehension without feeling like you are studying. Watching popular

English movies and listening to English music would also be a great motivation to understand English.

6. Schools should provide and add more books, textbooks and reading materials in the library to accommodate more students to help improve their craft in English skills.

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LEVEL OF EARTHQUAKE AWARENESS OF ENGINEERING STUDENTS AT EARIST: BASIS FOR AN ACTION PLAN

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INTRODUCTION

One of the most fear-provoking and crucial phenomena of nature is a stern earthquake and its dreadful effects to humankind and surroundings. No one can ever foretell the accuracy of the happening of an earthquake being known to exist as an abrupt movement of Earth's crust due to unexpected discharge of tension that was built over a particular length of time (Ready Genesee, 2018).

The plate tectonics function as the components responsible for shaping the Earth as large plates that compose the surface of the Earth little by little as they move in different motions through each other. From the accumulation of energy, there is a growing strength that can suffice and sustain the impact to let plates disentangle forcefully where the occurrence may cause casualties and damage to properties seriously (O'Kelly, 2016).

In places where there is a high tendency of an earthquake hazard, structures are designed to withstand the impacts of earthquakes. Pre-emptive measures to easily define actions suitable as measures when an earthquake occurs help many people to gain awareness of how to face the earthquake as one of the major disasters of nature. This connotes the orientation of society to have knowledge and resources to make earthquake preparedness for them ready and available for their earthquake survival (Taylor, 2017).

In the modern time, as knowledge evolves, people attempted to challenge the main assumption that earthquakes must present an irrepressible and erratic hazard to all existence and property. The detection of the locations and likelihoods of future hazardous earthquakes became subject of scientists for better estimates (Kelman, 2015).

The primary reason why the researcher desires to have a more comprehensive and a crystal-clear understanding about level of earthquake awareness of pupils is to propose some recommendations that the school, teachers, community and students can apply during any earthquake occurrences as concrete earthquake preparedness responses. Likewise, the researcher can see vitality of level of awareness level for school safety planning and assessment of response capacity of pupils. Noticeable shakes happen each year so there must be a more dynamic awareness of earthquake preparedness at school premises.

STATEMENT OF THE PROBLEM

This study sought to determine the level of earthquake awareness of engineering students from first year to fifth year college of Eulogio Amang Rodriguez Institute of Science and Technology.

1. What is the demographic profile of the College of Engineering students, School Year 2019-2020 in terms of:

    1.1 age;
    1.2 gender; and
    1.3 year level?

2. To what level of earthquake awareness the pupils are aware of the following terms;

2.1 basic earthquake facts;
2.2 earthquake preparedness needs and drills; and
2.3 school program regarding earthquake preparedness?

3. Is there a significant difference between the lower and upper students in terms of their level of earthquake awareness?

4. What proposed action plan is recommended to enhance the earthquake awareness of college of engineering students of EARIST?

MATERIALS AND METHODS

In this study, descriptive correlation method of research was applied. This research design aimed to present facts about the level of earthquake awareness of College of Engineering students in EARIST in Metro Manila in order to be the basis for action plan.

This study used mean and test of difference as the statistical tool to tabulate and analyze the data from the survey. Data analysis started with the tabulation of the responses of the students from different year levels of their assessed level of awareness and preparedness on earthquake occurrence.

RESULTS AND DISCUSSION

The following were the result on the research problem regarding the level of earthquake awareness of EARIST engineering students:

Table 1
Age Distribution of the Student– Respondents

Age	Frequency	Percentage
26 years	1	0.8
25 years	1	0.8
24 years	14	11.7
23 years	19	15.8
22 years	20	16.7
21 years	18	15.0
20 years	21	17.5
19 years	24	20.0
18 years	2	1.7
Total	120	100%

Mean Age = 21.28 years

Table 1 shows the range of age of the students- respondents is from 18 years old to 26 years old only. With a total of 100% participation in the survey, the age distribution of the respondents of this study has the mean age of 21.28 years. This manifests that there is a higher number of respondents less than 21 years old from EARIST College of Engineering for School Year 2019-2020 who participated this study.

Table 2
Respondents' Gender

Gender	Frequency	Percentage
Male	61	50.8
Female	59	49.2
Total	120	100%

Table 2 presents the demographic profile of the students-respondents in terms of gender. 100% of the target respondents completed this survey. Among 120 students who became part of this study, 50.8% was male while 49.2% was female. This reveals that there is a higher participation of male pupils in this study.

Table 3
Collegiate Year Levels of the Respondents

Year Level		Frequency		Percentage	
Lower Class		60		50	
General	Engineering		20		16.7
	Year 1		20		16.7
	Year 2		20		16.7
Upper Class		60		50	
	Year 3		20		16.7
	Year 4		20		16.7
	Year 5		20		16.7
Total		120	120	100%	100%

Table 3 conveys that 16.7% is the equal distribution of students- from the different year-level in the lower and upper years. There are 120 students involved in this study and 100% of each year level cooperated to participate in this study.

Table 4
Awareness of the Students of Basic Earthquake Facts

	Indicator	Mean	SD	CV	Interpretation
1.	I am aware that a destructive earthquake will hit places in the country anytime.	4.18	1.06	25.36%	Highly Aware
2.	I am aware that the Philippines have active volcanoes that can trigger different earthquakes.	3.82	1.10	28.80%	Highly Aware
3.	I am aware that the Philippine earthquake can reach 7.2 magnitudes on the Richter scale.	3.28	1.22	37.20%	Moderately Aware
4.	I am aware of the possible threats and risks when there is an earthquake.	4.08	1.13	27.70%	Highly Aware
5.	I am aware of the latest earthquake event.	4.14	1.10	26.70%	Highly Aware
	Overall Awareness of Basic Earthquake Facts	**3.90**	**0.68**	**17.14%**	**Highly Aware**

SD: Standard Deviation *CV: Coefficient of Variation*
4.50-5.00 Very Highly Aware *2.50-3.49 Moderately Aware* *1.00-1.49 Not Aware*
3.50-4.49 Highly Aware *1.50-2.49 Minimally Aware*

Table 4 shows that the level of Awareness of Basic Earthquake Facts revealed that mean of 4.18 was gained for the statement that "I am aware that a destructive earthquake will hit places in the country anytime" and thus the interpretation is highly aware. Likewise, the statements of "I am aware that the Philippines have active volcanoes that can trigger different earthquakes, "I am aware of the possible threats and risks when there is an earthquake. "I am aware of the latest earthquake event' resulted to mean of 4.08, 4.14 and 3.90 with respective interpretation as all highly aware. The statement I am aware that the Philippine earthquake can reach 7.2 magnitudes on the Richter scale acquired a mean of lowest mean of 3.28 under earthquake facts awareness of the students which is equal to being moderately aware only. Overall awareness is considered highly aware. This illustrates that the majority of the lower and upper year level students gained knowledge and awareness in the level of being highly-aware in terms of basic earthquake facts.

Table 5
Overall Level of the Respondents' Awareness of Basic Earthquake Facts

Level	Range	Interpretation	f	%	Rank
5	4.50 – 5.00	Very Highly Aware	22	18.3	3
4	3.50 – 4.49	Highly Aware	67	55.8	1
3	2.50 – 3.39	Moderately Aware	27	22.5	2
2	1.50 – 2.49	Minimally Aware	4	3.3	4
		Total	**120**	**100%**	

Mean Level = 3.90 Interpretation: Highly Aware

No respondent falls under Level 1.

Table 5 revealed that highest frequency of the students- respondents comprised those students who manifested to be highly aware of the basic earthquake facts with 55.8% rating. The second highest extent of awareness of the respondents is being moderately aware constituting 22.5% of the entire sample. On the other hand, only 18.3% showed to be of very highly aware of extent of awareness regarding basic earthquake facts. Only 3.3% presented with minimally aware extent of awareness regarding basic earthquake facts. Overall, the level of awareness inclined to mean level of 3.90 interpreted as highly aware. It transcends the ability of majority of the respondents to cope with basic earthquake facts with being highly –aware.

Table 6
Students' Level of Awareness of Earthquake Preparedness and Drills

	Indicator	Mean	SD	CV	Interpretation
1.	I am aware of the earthquake drills.	4.73	0.60	12.68%	Highly Aware
2.	I am aware of the safe spot in our schools and home where I can go during earthquake.	4.53	0.71	13.67%	Highly Aware
3.	I am aware that a first aid kit is important so I have prepared it intact in my bag always.	3.78	1.37	36.24%	Highly Aware
4.	I ensure to fasten all things that may fall anytime.	3.49	1.15	32.93%	Moderately Aware
5.	I am able to finish a workshop about earthquake preparedness.	3.30	1.21	36.67%	Moderately Aware
Overall Awareness of Earthquake Preparedness Needs and Drills		**3.97%**	**0.55**	**13.85%**	**Highly Aware**

Table 6 presents those statements "I am aware of the earthquake drills", "I am aware of the safe spot in our schools and home where I can go during earthquake, and "I am aware that a first aid kit is important so I have prepared it intact in my bag always" acquired mean of 4.73, 4.53 and 3.78 respectively with similar interpretation of being on the extent of being highly aware. On the other hand, statements "I ensure to fasten all things that may fall anytime", and "I am able to finish a workshop about earthquake preparedness" are interpreted to have the extent of being moderately aware with mean of 3.49 and 3.30 respectively. From this, the last two statements need to be inculcated to most of the students to be of higher level of awareness. Overall, the students exhibited to attain Overall Awareness of Earthquake Preparedness Needs and Drills as highly aware.

Table 7
Overall Level of the Respondents' Awareness of Earthquake Preparedness Needs and Drills

Level	Range	Interpretation	f	%	Rank
5	4.50 – 5.00	Very Highly Aware	24	20.0	3
4	3.50 – 4.49	Highly Aware	69	57.5	1
3	2.50 – 3.39	Moderately Aware	25	20.8	2
2	1.50 – 2.49	Minimally Aware	2	1.7	4
		Total	**120**	**100%**	

Mean Level = 3.97 Interpretation: Highly Aware

No respondent falls under Level 1.

The overall level of the respondents' level of earthquake awareness in terms in table 7 reveals that 57.5% or 69 out of 120 pupils are highly-aware about preparedness and drills. This factor was ranked first having the highest frequency. Second in rank was the 'moderately aware' description with 20.8% or 25 pupils who were considered second highest level of awareness in terms of preparedness and drills of earthquake awareness. This result is roughly 36.23% less than the number of the highly-aware students. A third in rank exhibited with 20% or 24 student respondents categorized as very highly-aware, the highest score interpretation. Only 1.7% or 2 pupils were expounded as minimally ware in fourth rank regarding earthquake preparedness and drills.

Sadly, these two students manifested to fall under Level 1 which is categorized as the lowest level of awareness. Consolidating these findings was the recorded overall mean score=3.97 in level of awareness scale for assessing preparedness and drills where the students were generally assessed as highly-aware as a whole.

Table 8 explains about the 3 level of awareness of the students in terms of school program on earthquake preparedness. The overall awareness of the students-respondents is 4.10 for Mean and Coefficient Variation of 14.39% which is equal to interpretation of them as highly aware in the overall insights of the said factor. The factor statement "I am aware that hazards can happen and emergency kit should be always ready" has the highest score with interpretation as a highly-aware level of awareness. The last among the rest is the statement stating "I am aware that school programs regarding earthquake and other disaster risk reduction guides me to avoid panicking when the earthquake is happening' which resulted to only 18. 92% Coefficient of Variation but still a good level of awareness as it resulted to a highly aware level.

Table 8
Students' Level of Awareness of the Program on Earthquake Preparedness

Indicator	Mean	SD	CV	Interpretation
1. I am aware that school programs regarding earthquake and other disaster risk reduction helps me become aware of accompanying hazards.	4.33	0.96	22.17%	Highly Aware
2. I am aware that school programs regarding earthquake and other disaster risk reduction guides me to avoid panicking when the earthquake is happening.	4.44	0.84	18.92%	Highly Aware
3. I am aware that hazards can happen and emergency kit should be always ready.	3.85	1.29	33.51%	Highly Aware
4. I am aware of ways to mitigate situations in times of a disaster like an earthquake.	3.83	1.18	30.81%	Highly Aware
5. I am aware of significance of proper education regarding earthquake and other disaster risk reduction drills.	4.05	1.05	25.83%	Highly Aware
Overall Awareness of School Program on Earthquake Preparedness	**4.10**	**0.59**	**14.39%**	**Highly Aware**

Table 9
Overall Level of the Respondents' Awareness of the School Program on Earthquake Preparedness

Level	Range	Interpretation	f	%	Rank
5	4.50 – 5.00	Very Highly Aware	41	34.2	2
4	3.50 – 4.49	Highly Aware	60	50.0	1
3	2.50 – 3.39	Moderately Aware	19	15.8	3
		Total	**120**	**100%**	

Mean Level = 4.10 Interpretation: Highly Aware

No respondent falls under Level 1 or 2.

Table 9 discusses about the overall level of the student's awareness of the school program on earthquake preparedness where 50% of the students-respondents reacted to be highly-aware. The second majority comprised by 34.2% of the students-respondents exhibited a general interpretation of the level of awareness as very highly- aware. The remaining population manifested to be moderately aware constituting 15.8% of the respondents. No respondents fall under Level 1 or 2 which is categorized as minimally aware and not aware at all respectively. Corroborating these findings was the recorded overall mean score equal to 4.10 in overall awareness regarding earthquake preparedness and entirely considered to be highly-aware population of the school.

Table 10 shows the significance of difference between the levels of awareness of earthquake facts of the lower year and upper year students. Basically, the indicators correlated with level of awareness of earthquake preparedness are tested for significance. Indicator statement "Awareness that a destructive earthquake will hit places in the country anytime" displays significant difference between the levels of awareness of earthquake facts of the lower year and upper year students with mean of 4.37 and 3.98 respectively and with t-value of 2.05 and 1.98.

Table 10
Significance of Difference between the Levels of Awareness of Earthquake Facts of the Lower Year and Upper Year Students

Indicator	Mean		SD		t – Value at 0.05 alpha		Interpretation/ Ho Decision
	LY	UY	LY	UY	Comp	Tab	
Awareness that a destructive earthquake will hit places in the country anytime	4.37	3.98	0.84	1.21	2.05	1.98	Significant/ Reject
Awareness that the Philippines has active volcanoes that can trigger different earthquakes	3.63	4.00	0.90	1.25	1.86	1.98	Not Significant/ Accept
Awareness that the Philippine earthquake can reach 7.2 magnitude on the Richter scale	3.52	3.05	1.23	1.17	2.14	1.98	Significant/ Reject
Awareness of the possible threat and risks when there is an earthquake	4.00	4.17	1.16	1.11	0.82	1.98	Not Significant/ Accept
Awareness of the latest earthquake event	4.38	3.90	0.88	1.24	2.45	1.98	Significant/ Reject
Overall Awareness of Earthquake Facts	**3.98**	**3.82**	**0.60**	**0.75**	**1.29**	**1.98**	**Not Significant/ Accept**
Df item 1 = 105		Df item 3 = 118			Df item 5 = 106		
Df item 2 = 107		Df item 4 = 118			Df overall = 113		

SD: Standard Deviation P: Lower Year I: Upper Year Comp: Computed Tab: Tabular

Thus, the result contributed to the null hypothesis decision as to be rejected. The indicator statement "Awareness that the Philippines has active volcanoes that can trigger different earthquakes" resulted to having t-value of 1.86 and 1.98 for primary and intermediate students respectively. This conveys that there is no significant difference between the levels of awareness of earthquake facts of the lower year and upper year students. On the other hand, the Ho decision is to accept. In the indicator statement "awareness that the Philippine earthquake can reach 7.2 magnitudes on the Richter scale" exhibited to show significant difference so the Ho decision is interpreted to be rejected. Indicator statement stating "Awareness of the possible threat and risks when there is an earthquake" posed with t- value of 0.82 and 1.98 respectively which shows to be not significant and creates an outcome more helpful to wider communities. There is significant difference in terms of awareness between lower and upper year level which means the concept is to be rejected. Likewise, there is a significant awareness of the latest earthquake event and thus considered to have decision to reject. Overall Awareness of Earthquake Facts is considered to have no significant difference and thus said to attain a decision to accept.

Table 11 depicts that the indicator statement 'Awareness of earthquake drills awareness of the safe spot in the school and home where he/she go to during an earthquake' is claimed to be not significant and thus to be accepted with t- values as 0.63 and 1.98 respectively. Moreover, statement "Awareness of the importance of a first aid kit and keeping one in his/her bag always' garnered a t-value of 0.00 and 1.98 respectively and thus considered to be not significant and thus the decision of hypothesis is to accept. In the indicator statement "Can ensure to fasten all things that may fall anytime", the t-value resulted with 5.41 and 1.98 for lower year and upper year level, the interpretation is that it significant and the effect is to reject the hypothesis decision. The indicator statement, "having finished a workshop about earthquake preparedness" with t-value of 1.54 and 1.98 respectively implies being significant

and the Ho decision is to reject. The overall awareness of earthquake preparedness needs and drills reveals to have the t-value of 3.45 and 1.98 respectively which means that it is said to be significant and the decision is to reject.

Table 11

Significance of Difference between the Levels of Awareness of Earthquake Preparedness Needs and Drills of the Primary and Intermediate Students

Indicator	Mean		SD		t – Value at 0.05 alpha		Interpretation/ Ho Decision
	LY	UY	LY	UY	Comp	Tab	
Awareness of earthquake drills	4.70	4.77	0.67	0.53	0.63	1.98	Not Significant/ Accept
Awareness of the safe spot in the school and home where he/she go to during an earthquake	4.53	4.53	0.70	0.72	0.00	1.98	Not Significant/ Accept
Awareness of the importance of a first aid kit and keeping one in his/her bag always	3.97	3.58	1.19	1.51	1.57	1.98	Not Significant/ Accept
Can ensure to fasten all things that may fall anytime	4.00	2.98	0.82	1.21	5.41	1.98	Significant/ Reject
Having finished a workshop about earthquake preparedness	3.47	3.13	0.95	1.42	1.54	1.98	Not Significant/ Accept
Overall Awareness of Earthquake Preparedness Needs and Drills	4.13	3.80	0.39	0.63	3.45	1.98	Significant/ Reject
Df item 1 = 112	Df item 3 = 112				Df item 5 = 103		
Df item 2 = 118	Df item 4 = 104				Df overall = 98		

Table 12

Significance of Difference between the Levels of Awareness of the School Program on Earthquake Preparedness of the Lower Year and Upper Year Students

Indicator	Mean		SD		t – Value at 0.05 alpha		Interpretation/ Ho Decision
	LY	UY	LY	UY	Comp	Tab	
Awareness that school programs regarding earthquake and other disaster risk reductions help him/her become aware of accompanying hazards	4.32	4.35	0.68	1.19	0.17	1.99	Not Significant/ Accept
Awareness that school programs regarding earthquake and other disaster risk reductions guide him/her to avoid panicking when earthquake happens	4.38	4.50	0.90	0.77	0.78	1.98	Not Significant/ Accept
Awareness that hazards can happen and emergency kit should be always ready	4.37	3.33	0.99	1.35	4.81	1.98	Significant/ Reject

Awareness of ways to mitigate situations during disaster like an earthquake	3.95	3. 72	1.14	1.21	1.07	1.98	Not Significant/ Accept
Awareness of significance of proper education regarding earthquake and other disaster risk reduction drills	4.10	4.00	0.99	1.12	0.52	1.98	Not Significant/ Accept
Overall Awareness of School Program on Earthquake Preparedness of the Lower Year and Upper Year Level	4.22	3.98	0.53	0.63	2.26	1.98	Significant/ Reject
Df item 1 = 112		Df item 3 = 112			Df item 5 = 103		
Df item 2 = 118		Df item 4 = 104			Df overall = 98		

Table 12 demonstrates that overall awareness of School Program on Earthquake Preparedness of the Lower Year and Upper Year has t-value of 2.26 and 1.98 respectively and considered as significant and thus will reject the hypothesis decision of the study. Breaking down, the indicator statement "Awareness that school programs regarding earthquake and other disaster risk reductions help him/her become aware of accompanying hazards" with t-value of 0.17 and 1.99 respectively and classified as not significant and the effect will be to accept the Ho decision. Likewise, the indicator statement "Awareness that school programs regarding earthquake and other disaster risk reductions guide him/her to avoid panicking when earthquake happens" with garnered t-value of 0.7 and 1.98 which means the insight is not significant and thus accept the decision of Ho.

Table 13
Significance of Difference between the Levels of Earthquake Awareness of the Lower Year and Upper Year Students

Indicator	Mean		SD		t – Value at 0.05 alpha		Interpretation/ Ho Decision
	LY	UY	LY	UY	Comp	Tab	
Awareness of Earthquake Facts	3.98	3.82	0.60	0.75	1.29	1.98	Not Significant/ Accept
Awareness of Earthquake Preparedness Needs and Drills	4.13	3.80	0.39	0.63	3.45	1.98	Significant/ Reject
Awareness of the School Program on Earthquake Preparedness	4.22	3.98	0.53	0.63	2.26	1.98	Significant/ Reject
Overall Earthquake Awareness	**4.11**	**3.87**	**0.37**	**0.55**	**2.80**	**1.98**	**Significant/ Reject**
Df facts = 113	Df preparedness = 98		Df school program = 98				Df overall awareness=113

Table 13 shows that the significance of difference between the levels of earthquake awareness of the lower year and upper year levels. Awareness of Earthquake Facts garnered t-value of 1.29 and 1.98 respectively and thus considered not significant. The decision of Ho in this situation is rejected. In the factor "Awareness of Earthquake Preparedness Needs and Drills", the t-value is 3.45 and 1.98 which exhibits the significance difference is significant and thus Ho decision is to be rejected. In awareness of the school program on earthquake preparedness, the t-value resulted to 2.26 and 1.98 respectively and thus the statement is significant and the Ho decision is to reject. Finally, the overall earthquake awareness is significant and thus rejects the Ho decision as it displays t-value of 2.80 and 1.98 respectively.

Table 14
Proposed Action Plan

Action	Objective	Person Responsible	Teaching Strategy
1. Reprioritize the discussion of the earthquake facts.	1. Inculcate clearly the essential earthquake facts	NSTP Instructor/ Community Outreach Coordinator	Video Presentation/ Interactive-Discussion
2. Conduct role play activities.	2. Depict actual preparedness, drills and other responses that an individual has to possess if there is an actual earthquake.	NSTP Instructor/Community Outreach Coordinator	Reflective Discussion
3. Earthquake Drill Demo	3. To clarify to students the correct earthquake drills and responses to avoid casualties and injuries.	NSTP Instructor/ Community Outreach Coordinator	Video Presentation Interactive Discussion Simulation
4. Research Project	4. Augment the class with more scientific approach of learning by checking available information from textbooks or online sites.	NSTP Instructor/ Community Outreach Coordinator	Writing Collaborative Research with the Community Output Presentation

CONCLUSION/ RECOMMENDATION

Conclusion

1. The demographics profile has a higher number of respondents less than 19 years old, more male than females but with equal distribution of participants from lower year and upper year level.

2. The overall awareness of basic earthquake facts, preparedness needs and drills school program on Earthquake Preparedness is highly aware.

3. The overall Earthquake Awareness significance of difference for factors basic earthquake facts, preparedness needs and drills school program on Earthquake Preparedness is significant must.

4. The proposed action plan is focused on augmenting the existing awareness level of the students with a vibrant plan of activities relevant to learning earthquake awareness and effective teaching strategies to make it happen.

Recommendations

The following recommendations were made based on the findings of the study:

1. Next researchers may concentrate further studies relevant earthquake discussion and drill activities.

2. Further studies can be given to the significance of some school facilities to help students understand the preparedness, awareness and drills to manage earthquake situations.

3. A larger number of samples will suffice better flow of assessment and data.

4. A qualitative analysis of research may also be conducted for further insights such as Fire Drill, Bomb threat and other documented activities in the school.

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BRAINWAVE-CONTROLLED SMART ROOM USING ARTIFICIAL NEURAL NETWORK

Cid Mathew Adolfo
Rowell Condes et al.

INTRODUCTION

With our fast emerging technology, we are now in the era where we live with the evidences of some things that are decades-long been just a dream. With the people‘s constant needs and wants and to adapt with the ever-changing environment, inventions and researches bring immense impact in our society. To help reduce human workforce, to make living easier and more secured, and to provide more comfort and convenience to Earth‘s inhabitants are some of technology development‘s primary goals, in which this study conforms to, since it runs around the utilization of the development of Brain Computer Interface (BCI).

Numerous BCI systems propound a direct neural interface between the brain and other physical devices in such a way that enables human to communicate and control these devices using various brain movement patterns. BCI method has two classifications – invasive and non-invasive. Invasive BCI calls for a surgery to embed electrodes inside or on the cortex, while the non-invasive ones do not. Non-invasive BCI methods comprise magneto encephalogram, electroencephalogram (EEG), deoxyhemoglobin concentration, and blood-oxygen-level-dependent imaging. With these methods, EEG is the most commonly used because it responds quickly, has low cost, simple and capable of portable applications execution. Hence, a number of works has been implemented to control a variety of devices and appliances using EEG signals. For recognition and classification of EEG patterns, artificial neural network is applied.

Artificial neural networks (ANN) or —connectionist systems are reckoning systems roughly stirred by the biological neural networks that constitute animal brains. This kind of schemes "learns" to execute errands in view of samples, not needing to be programmed with task-specific rules in general. An ANN is based on an assemblage of linked units or nodes (artificial neurons), which lightly model the human brain neurons. Every linkage, similar to the synapses in a biological brain, can do a transmission of signal to other neurons. An artificial neuron signal recipient processes the signal it receives and can send signal to neurons linked to it. In ANN operations, real number is the "signal" at a connection and some non-linear function of the sum of the inputs of each neuron calculate its output. As learning makes headway, a weight that typically neurons and edges (connections) have, adjusts. The signal strength at edges is being modified (increased or decreased) by the weight. Neurons have a magnitude or intensity such that a signal will only be sent if this threshold is exceeded. Since neurons are characteristically aggregated into layers, different layers may make unalike input transformations. The travelling of signals starts from the first or the input layer to the last or the output layer, perhaps after crossing layers several times. The ANN approach principally aims to solve problems similarly to that of a human brain. For a reason that it is able to reproduce and model nonlinear processes, ANN has established applications in multiple fields. System identification and control are some of these application area inclusions. These aforementioned concepts have been essentially useful in the creation of this study.

As a recent trend in the Internet of Things (IoT), smart home systems, also termed as —home automation or—domotics, comprise devices that work together, allocate consumer usage data among themselves and mechanize actions based on the desired outputs of homeowners. This system has a central hub or —gateway‖ where controlled devices are all connected. Wall-mounted terminals, tablet or desktop computers, a mobile phone application, or a Web interface (that may also be available even when off-site, but with the internet) are

used as the user interface for control of the system. This technology allows users to control and monitor their connected home devices from smart home apps, smartphones, or other networked devices. This research then coined the idea of controlling these connected household devices using only brain commands for users' further convenience. It also contributes meaningfully to health and well-being augmentation by accommodating people with special needs, as well as the elderly.

Home security cameras and car miniature (to be applied mainly on wheelchairs) are the focuses of this study. Whether someone is a busy mother who wants to spy on her baby who's sleeping next room, or a pet owner who wants to check his pet from where it is located, or someone who needs to keep an eye to a bed-ridden patient or a sick individual or an elderly from a different room, or just concerned with the home security from the intruders, this study can turn on someone's preferred camera on his desired moment using only his thoughts on controlling them. In this way, energy efficiency and reduced electricity use are taking place since household cameras will turn on only if someone wants to. It also provides benefits to users by saving some of their physical efforts and by ensuring them with alerts, peace of mind and security.

Meanwhile, the application of the concept of brainwave control to miniature of a car, that will be commanded to move forward or backward, will further be put in implementation to wheelchairs so that its user will no longer be assisted by humans; instead, they would be capable of controlling it using their mind alone. In this manner, individuals who have appendage feebleness and different disabilities will then be offered more prominent freedom and enriched personal fulfillment, which will additionally make them more capable of doing various activities they want to do.

OBJECTIVE, STATEMENT, AND CONCEPT OF THE STUDY

Objective of the Study

Generally, this research is conducted to offer more convenience to humans simultaneous to coping up with the Industry 4.0, which aims at creating the so-called —smart industry.

Specifically, this study aims to:

- give assistance and provide more prominent independence to individuals with limb problems
- allow supervision (from the other room) to anyone who needs to be attended that is in another room (e.g. babies, sick individuals, etc.)

Statement of the Problem

Generally, this project aimed to build Brainwave-Controlled Smart Room Using Artificial Neural Network. It sought to answer the following research questions:

1. Who is the beneficiary of this project?
2. How can it help in the society?
3. What modes of technology are going to be used?

4. What is the assessment of the three groups of respondents namely: Students, Professionals and Experts in terms of the following criteria? Is there any significant difference?

   a. Functionality

   b. Usability

   c. Reliability

   d. Efficiency

   e. Maintainability

5. What claims can be derived from the developed invention and what can be proposed to improve the existing project?

Concept of the Study

Figure 1 – The system which the researchers developed for the study entitled —Brainwave-controlled Smart Room using Artificial Neural Network is composed of three major parts: the input system, the processing system and output system. The input system is where the brainwave signal gathered, collected and concatenated to separate the electrical activity of the user‘s brain to digital data and compiled and saved to common separated values (csv). The process system is where the common separated values (csv data) split to 80% and 20% samples to provide train data and test data through the predictive analysis of artificial neural network. The output system reveals the train data and test data are being used to test if the accuracy is precise to control the on and off of the camera and moving forward and backward of car miniature. The three systems are accompanied by the feedback system in which the systems are being learned along the process. The system runs through the connection of central hub/gateway and brainwave sensing headband where the programs run in the entire system.

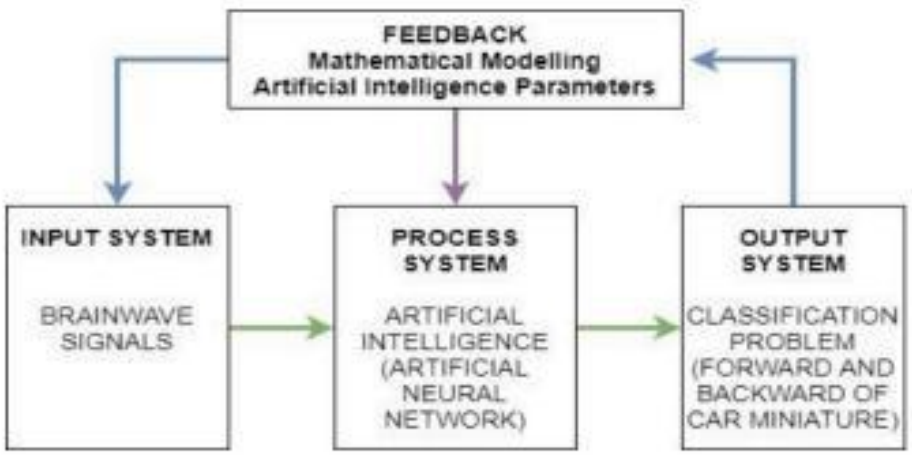

Figure 1: Conceptual Model of the Project

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter consists of review of related literature as well as the related studies, both local and international. The researchers have gathered some information relating to the project to provide additional materials. This chapter will also take over the synthesis of this project.

Based on the study conducted by Chepurwar on 2015, to serve the general public by aiding the distinctively-abled individuals is the principle objective behind growing such mind-controlled application on a wheelchair. EEG signals have numerous potential applications that are still not revealed: a reason that triggered this idea. It will be extremely valuable for creating improved applications when these EEG signals are deciphered in more astute manners. When such signals are processed, neurological peculiarities recognition and mind-controlled wheelchair are portions of the said applications.

Pavithra (2018) expounded that application of engineering sciences to design, develop, adapt, test, evaluate, apply, and distribute technological answers to issues faced by handicapped individuals is the rehabilitation engineering. Prosthetic arm, which is ordinarily engaged in advancing autonomous portability of arm, is by far the most widely utilized assistive device. In an occurrence of touching items (especially hot ones), paraplegics face obstructions; they also need aid in their day by day activities explicitly for essential hand developments, moving of objects and weight reliefs. These tasks by other humans are intended to be helpful to paraplegic yet it is a horrendous undertaking for them. For this reason, an economical creation of prosthetic arm for is prototyped so as to provide assistance to these physically-challenged individuals. The muscle signals are gathered and handed-off to the stepper motor by Muscle Sensor and EMG electrode. For this prosthetic arm to function, the reinforcing of the signal is established. EEG signals will also be collected using EEG electrode and will then be relayed to another stepper motor - this creates the hand flexion and expansion. Using user‘s brain waves, this prosthetic arm allows its user‘s hands to function productively.

Moreover, Bagherzadeh established a mind-controlled caino game last 2017 that is an automated technique for an electronic game which incorporates beginning a series of play while observing user‘s brain actions. This strategy takes in on deciding if at any rate, user‘s brain action surpasses a limit level and if so, changing an opportunity of winning the round of play will take place. Expanding the winning chance of the round of play may be assimilated in changing it.

Darien, et al created a project entitled ―Brain-Controlled Smart Home‖ and constructed a virtual reality model for studying with cerebral control of linked household devices. A huge number of individuals all over the globe have limb weaknesses or different inabilities that bring bounds to their abilities, making it hard for them to perform errands. By permitting remote control and programmability, smart-home gadgets can offer individuals with handicaps more prominent freedom and improved personal satisfaction. In any case, restricted ability additionally compels the kinds of controllers that an individual can utilize. In spite of the fact that voice acknowledgment is one potential arrangement, a collective Colorado State University students were motivated to go above and beyond: they're investigating the plausibility of controlling gadgets with our musings. As of late created, reasonable remote electroencephalography (EEG) gadgets empower ongoing observing and estimation of brainwaves without particular hardware. EEG patterns have been utilized to perceive feelings, giving an all the more captivating and improved client involvement with games and different situations. EEG frameworks have additionally been prepared to perceive explicit idea designs that can be converted into directions. The Brain-Controlled Smart Home (BCSH's) task will likely apply this idea-acknowledgment way to deal with home appliances. The EEG headset transmits remotely to a PC, which deals with the brainwave signals. Directions are then sent by means of Wi-Fi to empowered home gadgets. As opposed to preparing a real smart home, the

group built a virtual reality (VR) house with thought-actuated virtual gadgets. The VR condition filled in as an experimenting ground for improvement and furnished new clients with a realistic training experience.

MATERIAL AND METHODS

This chapter presents the research methodology, statistical treatment, supplies and materials, tools and equipment, construction procedure, try-out and revision, and the cost analysis of the Brainwave-Controlled Smart Room Using Artificial Neural Network.

The research used the developmental type of research which has been defined as the systematic study of designing, developing, and evaluating instructional programs, processes, and products that must meet criteria of internal consistency and effectiveness. Developmental research is particularly important in the field of instructional technology. The most common types of developmental research involve situations in which the product-development process is analyzed and described, and the final product is evaluated. A second type of developmental research focuses more on the impact of the product on the learner or the organization. A third type of study is oriented toward a general analysis of design development or evaluation processes as a whole or as components. A fundamental distinct should be made between reports of actual developmental research (practice) and descriptions of design and development procedural models (theory). Although it has frequently been misunderstood, developmental research has contributed much to the growth of the field as a whole, often serving as a basis for model construction and theorizing (Richey, 1994).

1. Brainstorming for the topic.
2. Gathering data through research.
3. Presentation of the proposed title.
4. Designing the project‘s software structure and program flow.
5. Deciding on where the researchers will apply and install their project.
6. Collection of materials and equipment that would be used for the whole project.
7. Project implementation and software development.
8. Testing and trial of the output.
9. Writing the final report of the thesis.
10. Final defense of the study.
11. Final checking of the output

Figure 2— The flowchart of the overall system. The system will initialize the brainwave signal to start and concatenate to 80% samples and 20% samples. The 80% samples lie on the train set wherein the artificial neural network has to be used in learning process and the construction of train data has to identify the rate of accuracy.

In the other hand, the 20% samples lie on the test set that split into two set of variables that lead the system in the testing process and accuracy process. The said two variables has been split is chosen to use in the process system of overall system. By the help of predictive analysis of artificial neural network, the brainwave signal transmitted to digital data is

technically saved to common-separated values data that being concatenated and being processed is used to classify the function of overall system

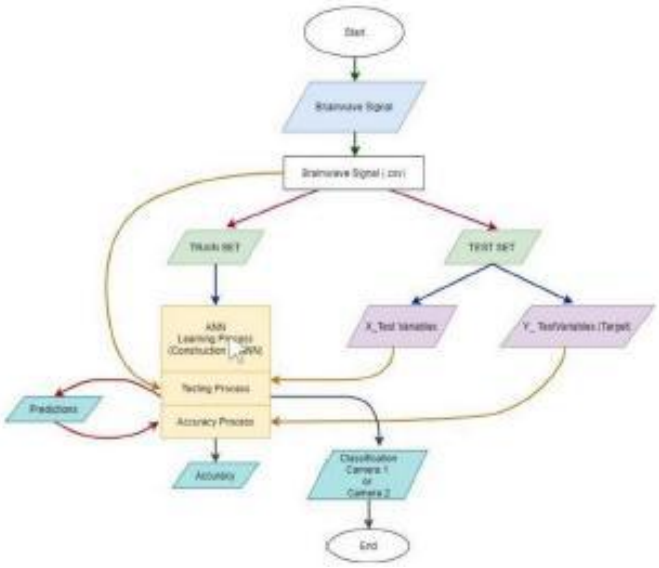

Figure 2: Flowchart of the System

Figure 3: Output of the System

RESULTS

This chapter shows the findings resulting from this study.

SOP 1. Who is the beneficiary of this project?

This study is conducted to offer more convenience to humans, especially those individuals who have limb weaknesses and different inabilities. They will be provided more prominent freedom and improved personal satisfaction, which will further make them more efficient in performing errands.

SOP 2. How can it help in the society?

Transformation of Smart Homes from just a fictitious thought intro reality, which has decade-long been a dream, is currently the blast in the Internet of Things. As technology evolves, this study will enhance this society‘s quality of life and will provide more comfort and convenience to humans.

SPO 3. What modes of technology are going to be used?

This study utilizes electroencephalogram (EEG) based BCI (Brain- Computer Interface, which provides a communication path between the human brain and the computer system, monitors brain waves which can then be sent to a virtual assistant that can decipher the number of signals coming and can determine a right output.

For recognition and classification of EEG patterns, artificial neural network is applied.

SOP 4. What is the assessment of the three groups of respondents namely: Students, Professionals and Experts in terms of the following criteria? Is there any significant difference?

Using Statistical Treatment, the Students, Professors, and Practitioners have similar assessment on the Brainwave-Controlled Smart Room Using Artificial Neural Network as to its usability, reliability, efficiency, and maintainability but have different valuation as to its functionality. In the ANOVA test carried out for the assessment of the respondents on the Brainwave-Controlled Smart Room Using Artificial Neural Network in terms of Functionality, a statistically significant difference at the level of $p<0.05$ was found in the between the assessment of all three groups of respondents. This result implies that the groups have different views in terms of the Functionality of the Brainwave-Controlled Smart Room Using Artificial Neural Network Compared to other groups of respondents.

SOP 5. What can be proposed to improve the existing project?

This study is a developmental scientific type and this is the beginning or the first phase so this research may further be studied even deeper, be applied with more mathematical models or statistical treatments for its output data to be filtered even better until it reaches the near-to-perfection operation.

CLAIMS AND CONCLUSION

This chapter presents the claims and conclusions based on the data analyzed in the summary of findings. This paper has discussed the design implementation of a Brainwave-Controlled Smart Room Using Artificial Neural Network.

CLAIMS

1. A system comprising:

    a. a system for gathering data;

    b. a system for controlling output devices; a system for graphic user interface; and

    c. a sensing headband has a system to automatically save the data of the users and other new users.

2. A system as in claim 1, wherein said sensing headband is said is to be connected and said wireless connection activated.

3. A system as in claim 1, further comprising sensing headband is said to control output devices through the aforementioned system.

4. A system as in claim 1, wherein the new user for sensing headband uses the data gathered to connect to the network gateway in the system.

CONCLUSION

Based on the testing conducted and the findings of the study, the following conclusions are drawn:

1. According to the evaluation result of the functionality of the system, the degree to which the sets functional completeness, correctness, and appropriateness were interpreted as —Excellent or Highly Acceptable‖ by the respondents, which means that the functionality of this research, provided the specific tasks and user objectives, correctness of results with the needed degree of precision, and facilitated the accomplishments of specified tasks and objectives.

2. According to the evaluation result of the usability of the system, the degree to which the sets operability and accessibility were interpreted as —Excellent or Highly Accepted by the respondents, which means that the usability of this research have attributes that make it easy to operate and control and can be used by people with widest range of characteristics and capabilities to achieve a specified context of use.

3. According to the evaluation result of the reliability of the system, the degree to which the sets maturity and availability were interpreted as —Excellent or Highly Accepted by the correspondents, which means that the reliability of this research has met the needs or reliability under normal operation and it was operational and was accessible when required for use.

4. According to the evaluation result of the efficiency of the system, the degree to which the sets time behavior, resource utilization and capacity were interpreted as —Excellent or Highly Accepted by the respondents, which means that the efficiency of this research met the requirements of performing its functions.

5. According to the evaluation result of the maintainability of the system, the degree to which the sets modularity, reusability and modifiability were interpreted as —Excellent or Highly Accepted‖ by the respondents, which means that the maintainability of HYSCAP was composed of discrete components such that a change to one component had minimal impact on other components, an asset can be used in more than one system, or in building other assets and can be effectively and efficiently modified without introducing defects or degrading existing system quality.

Therefore, it can be inferred that this study is able to control devices in the smart room, specifically for the camera and car miniature. Furthermore, this will be very advantageous especially to physically-constrained individuals for they will be provided more prominent movement independence. Moreover, this research, when gone through a more thorough experimentation, will be beneficial to the society for the enhancement of our quality of life.

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PAGBUO NG PAGSUSULIT PANGKWALIPIKASYON PARA SA BATSIYER NG PANSEKUNDARYANG EDUKASYON SA FILIPINO

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Conrado Blando
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INTRODUKSYON

Ang Quezonian Educational College ng Atimonan, Quezon ay nagkakaloob ng programang Batsilyer sa Pansekundaryang Edukasyon sa Filipino para sa mga nagnanais magpakadalubhasa sa Filipino. Sa pagpili ng mga mag-aaral na tatanggapin sa programang ito, ang Departamento ng Filipino nang nasabing kolehiyo ay may inihandang pagsusulit pangkwalipikasyon. Ito ay mayroong dalawandaang (200) aytem na nakabatay sa apat na makrong kasanayan – pakikinig, pagsasalita, pagbasa at pagsulat. Integratibo at diskretong aytem ang siyang ginamit na sumasaklaw sa mga sumusunod na kurso sa Filipino: Fil 1- Sining at Komunikasyon sa Filipino, Fil 2 – Pagbasa at Pagsulat sa Iba't Ibang Disiplina at Fil 3 – Retorika/Panitikan. Ang pagsusulit na ito ay nilikha ni Catapang (2010), guro sa Filipino nang nasabing kolehiyo. Ito'y kanyang pananaliksik sa antas masterado sa Pamantasang Normal ng Pilipinas-Manila.

Ang Departamento ng Filipino at ng iba pang Wika ng Mindanao State University-Iligan Institute of Technology ay mayroong pagsusulit pangkwalipikasyong ibinibigay para sa mga mag-aaral na nagnanais magpakadalubhasa sa Filipino. Katulad sa pagsusulit pangkwalipikasyon sa Filipino ng Quezonian Educational College, ito ay binubuo rin ng mga integratibo at dskritong aytem. Ang pinagkaiba lang nito, binubuo lamang ito ng isandaan at limampung (150) aytem na sumasaklaw sa mga sumusunod na kurso sa Filipino:Fil 54N – Panimulang Linggwistika, Fil 103 – Maikling Kwento, Fil 107N – Introduksyon sa Pamamahayag, Fil 108N- Gramatika at Istruktura at Fil 102 – Sanaysay. Ang pagsusulit na ito ay nilikha ni Dizonbr (2014), Puno ng Departmento ng Filipino ng kolehiyong ito.

Ang Pamantasang Normal ng Pilipinas-Manila ay nagbibigay rin ng pagsusulit pangkwalipikasyon para sa mga mag-aaral na nagnanais magpakadalubhasa sa Filipino. Malaki ang pagkakaiba nito sa pagsusulit pangkwalipikasyon sa Filipino ng dalawang nabanggit na mga pamantasan. Ito'y sa kadahilanang ang mga aytem nito ay nasa anyong pagganap o *performance task.* Nahahati ito sa dalawang bahagi: Ang una ay ang pasulat na bahagi na binubuo ng tatlong gawain – ang Surilarawan na nakatuon sa pagsusuri ng mga larawang nagpapakita ng ugnayan ng wika at lipunan, sunod ay ang Ambag/Sawikaan na nakatuon sa paglikha ng salita mula sa nauusong wika na nagmula sa umuusbong na domeyn o mga salitang produkto ng panlipunang penomenon. At ang huli, ang Ako sa Hinaharap Bilang Guro sa Filipino na nakatuon naman sa paglalahad ng mga nagnanais magpakadalubhasa sa Filipino ng kanilang magiging ambag sa larangan ng pagtuturo ng Filipino. Ang ikalawa naman ay ang pagtatanghal na bahagi na tinatawag na Filipino Got Talent. Nakatuon ang gawaing ito sa presentasyon ng mga nagnanais magpakadalubhasa sa Filipino ng kanilang mga natatanging talento na may kaugnayan sa wika at panitikan. May kaukulang rubrik para sa dalawang bahaging ito ng pagsusulit. Ang pagsusulit na ito ay nilikha ni Villanueva (2018), guro sa Filipino ng pamantasang ito.

Ang pagsusulit na ipinagkakaloob ng mga nasabing kolehiyo para sa kanilang mga mag-aaral na nagnanais magpakadalubhasa sa Filipino ay alinsunod sa kautusan na inilabas ng Komisyon ng Mataas na Edukasyon. . Ito ay ang Memorandum Blg 22 Serye 2017 na tumutukoy sa Mga Patakarang Pamantayan at Panununtunan Para sa Batssilyer sa Pagtuturo

ng Filipino. Nakasaad sa Seksyon 11 nito na ang sinumang unibersidad na nagkakaloob ng kursong Batsilyer sa Pagtuturo ng Filipino ay nararapat na magkaloob ng isang pagsusulit pangkwalipikasyon.

Ang pagsusulit pangkwalipikasyon ay isang pagsusulit na kinukuha ng isang indibidwal upang madetermina kung siya ay kwalipikado para sa isang trabaho o propesyong nais niyang pasukin. Ginagamit din ito sa mga hayop, katulad na lamang sa pagdetermina kung ang isang kabayo ay kwalipikadong pangkarera o ang isang aso ay kwalipikadong makasama sa operasyon ng mga pulis. (Tapdasan, 1994).

Ayon kay Marquez (2011), ang pagsusulit pangkwalipikasyon ay higit na ginagamit sa larang ng edukasyon. Paliwanag ni Marquez, ang pagsusulit na ito ay ginagamit ng mga unibersidad upang sukatin ang kakayahan o kapasidad ng isang mag-aaral sa programang nais niyang kunin. Ang resulta ng pagsusulit na ito ang siyang magiging batayan ng mga unibersidad kung siya ba ay tatanggapin sa programang nais niyang kunin o dili kaya ay ang pagpili ng programang nararapat sa kanyang kasanayan.

Samantala, ang Eulogio Amang Rodriguez Institute of Science and Technology o ang kolehiyong pinagtuturuan ng mga mananaliksik ay hindi sinunod ang memorandum na inilabas ng Komisyon ng Mataas na Edukasyon. Ang nasabing kolehiyo ay walang pagsusulit pangkwalipikasyon para sa mga mag-aaral na nagnanais magpakadalubhasa sa Filipino. Dahil dito, maaaring makompromiso ang misyon ng kolehiyong ito na makapagprodyus ng mga guro sa Filipino na may *kumpetensiya*, *kahusayan* at *disiplina* pagdating sa pagtuturo kapag kung sino-sino na lamang ang tatanggapin sa programang Batsilyer sa Pansekundaryang Edukasyon sa Pagtuturo ng Filipino. Ang suliraning ito ang siyang nagtulak sa mga mananaliksik na gumawa ng isang pagsusulit pangkwalipikasyon sa Filipino. Inaasahang sa tulong nito, mapapadali ang pagpili ng kolehiyong ito sa mga mag-aaral na kanilang tatanggapin sa programang Batsilyer sa Pansekundaryang Edukasyon sa Pagtuturo ng Filipino. Sa tulong din nito, makatitiyak ang kolehiyo ng Eulogio ng Amang Rodriguez Institute of Science and Technology na ang mapipiling mag-aaral sa programang ito ay masasabuhay ang misyon ng kolehiyo.

PAGLALAHAD NG LAYUNIN

Panngunahing layunin ng pag-aaral na ito na makabuo at mabalideyt ang pagsusulit pangkwalipikasyon para sa mga magpapakadalubhasa sa Filipino. Nilalayon ng pag-aaral na ito na:

1. Masubok ang ginawang pagsusulit pangkwalipikasyon sa Filipino.
2. Mabalideyt ang ginawang pagsusulit pangkwalipikasyon sa Filipino.
3. Maisapinal ang ginawang pagsusulit pangkwalipikasyon sa Filipino.

PAMAMARAAN

DISENYO

Ang pag-aaral na ginawa ay isang deskriptibong debelopmental na pag-aaral na may layuning makabuo at maabalideyt ang pagsusulit pangkwalipikasyon para sa mga magpapakadalubhasa sa Filipino. Sa pagsasakatuparan ng nasabing layunin, sinunod ng mga mananaliksik ang mga sumusunod na proseso sa pagbuo at pagbalideyt ng isang pagsusulit.

YUGTO NG PAGBUO – Ito ay nakatuon sa paghahanda ng instrumentong gagamitin sa pananaliksik at pagsulat sa mga aytem ng pagsusulit pangkwalipikasyon sa Filipino. Sa bahaging ito, isinakatuparan ng mga mananaliksik ang mga sumusunod:

Pagtukoy sa mga Nilalaman ng Pagsusulit

Ang nilalaman ng pagsusulit na ito ng mga mananaliksik ay sumasaklaw sa mga sumusunod na kurso sa Filipino: Fil 7 - Pagtuturo at Pagtataya sa Pakikinig at Pagsasalita, Fil 8 - Pagtuturo at Pagtataya sa Pagbasa at Pagsulat at Fil 11 – Pananaliksik. Hinalaw sa mga nabanggit na kurso ang mga gawain sa pakikinig, pagsasalita, pagbabasa, pagsulat at panonood.

Paghahanda ng Talaan ng Ispesipikasyon

Sa pagpili ng mga komunikatibong gawain sa Filipino, kinosulta ng mga mananaliksik ang mga guro sa Filipino ng Kolehiyo ng Eulogio Amang Rodriguez Institute of Science and Technology (tingnan sa Apendeks A) na nagtuturo sa mga medyor sa Filipino. Gamit ang inihandang tseklist ng mga mananaliksik (tingnan sa Apendeks B), tinukoy ng mga nasabing guro ang mga gawaing angkop sa kasanayan sa pakikinig, pagsasalita, pagbasa, panonood at pagsulat. Mula sa mga impormasyong nakalap, bumuo ang mga mananaliksik ng Talaan ng Ispesipikasyon. Nilalaman nito ay ang mga kasanayang tatayain, bilang ng mga aytem, antas ng katanungan ayon sa nirebisang Taksonomiya ni Bloom at mga uri ng pagsusulit.

Pormat ng Pagsusulit

Ang pagsusulit na binuo ng mga mananaliksik ay nakabatay sa Teorya ng Kakayahang Komunikatibo nina Canale at Swain (1980). Ipinapakita nito na ang diin ay nasa kabatiran ng paggamit sa wika at hindi sa kabatiran sa istruktura o porma nito. Kaya naman sa pagsusulit na gagawin ng mga mananaliksik, ang mga aytem ay nasa anyong pagganap o *performance task based.* May nakalaang rubrik bilang gabay sa pagsasakatuparan nito.

Pagsulat ng Aytem

Ang pagsusulit na ito'y mayroong 100 aytem. Binubuo ito ng mga pagganap na uri ng aytem. Sa pagsulat nito, naging saligan ng mga mananaliksik ang mga simulain ni Gronlund (1969). Ayon kay Gronlund, ito ay nararapat na: (1) sumusukat sa mga tiyak na kasanayan ayon sa mga layuning pampagtuturo, (2) nasa tumpak at katamtamang kahirapan, (3) malinaw at madaling maunawaan ng mga mag-aaral at (4) makatulong sa pagpapaunlad ng kaalaman ng mga mag-aaral at ikatatagumpay ng pagtuturo. Sa pagsulat ng panuto ng bawat mga gawain, susundin ng mga mananaliksik ang rekomendasyon ni Mauricio (2005). Ayon kay Mauricio, ang bawat panuto ng pagsusulit ay nararapat na maikli ngunit malinaw. Ito'y sa gayon upang madaling maunawaan ng gurong magbibigay ng pagsusulit. Halimbawa, sa pagsusulit sa pakikinig, dapat na malinaw na nakalahad kung ito ay babasahin lamang ng guro o dapat na ihanda ang cassete tape upang magamit sa pagsusulit. Pagdating sa oras na ilalaan sa mga gawain, susundin ng mga mananaliksik ang rekomendasyon ni Oracion (1999). Ayon kay Mauricio, nararapat na huwag magbigay ng mga gawaing gugugol nang mahabang oras. Nararapat na ang oras na ibibigay ay nakabatay sa antas ng kahirapan ng gawaing inilatag. Analitik ang siyang rubrik na gagamitin ng mga mananaliksik bilang batayan ng mga mag-aaral sa pagsasakatuparan ng mga komunikatibong gawain. Sa paggawa nito, susundin ng mga mananaliksik ang rekomendasyon ni Pangan (1990). Ayon kay Pangan, kinakailangang sundin ang mga sumusunod: una- tukuyin ang kasanayang tatayain, ikalawa- tiyaking maikli ang ise-set na krayterya at maikling paliwanag ukol dito. Ito ay upang mas madali sa mga kalahok ang

pag-unawa sa kung ano-ano ang mga dapat nilang paghusayan at pagtuunan ng pansin sa gawaing inihanda, at ikatlo- kailangang madali lamang masukat at maabot ng kakayahan ang mga itatalagang krayterya nang hindi rin maging malayo sa realidad ang gawaing susukatin.

YUGTO NG BALIDASYON – Ito ay nakatuon sa proseso ng pagsukat sa validiti at relayabiliti ng ginawang pagsusulit. Sa bahaging ito, isinakatuparan ng mga mananaliksik ang sumusunod:

Pagrebyu ng Aytem at Rebisyon

Sa pagsukat sa nilalaman ng ginawang pagsusulit, ipinasuri ito sa apat (4) na propesor na nagtuturo sa mga mag-aaral na nagpapakadalubhasa sa Filipino. Ginamit ng mga mananaliksik ang talatanungan ni Bermiso (2003) (tingnan sa Apendeks D) bilang instrumento ng pagtaya ng mga propesor sa kalinawan ng nilalaman ng pagsusulit. Ang resulta nito ang siyang ginawang batayan ng mga mananaliksik sa pag-edit o pagrebisa ng mga aytem na sinulat. Ito rin ang nagsilbing unang burador o draft ng qualifying examination para sa mga magpapakadalubhasa sa Filipino.

Unang Pagsubok (First Try out)

Matapos ipasuri sa mga eksperto ang unang burador ng pagsusulit, ito ay ipinasubok sa mga mag-aaral ng Kolehiyo ng Eulogio Amang Rodriguez Institute of Science and Technology. Convenience Sampling ang pamamaraang ginamit sa pagpili ng kalahok. Ito'y sa kadahilang mga mag-aaral sa kolehiyo ang siyang target na tagasagot ng pagsusulit na ito. At sa bagay na iyan, kumbyente para sa mananaliksik na gumamit ng convenience sampling sa pagpili ng kalahok sapagkat sa kolehiyo siya nagtuturo – sa Eulogio Amang Rodriguez Institute of Science and Technology. Gamit din ang pamamaraang ito, magiging madali para sa mananaliksik na i-administer at ipabalideyt sa kanyang mga kalahok ang kanyang ginawang pagsusulit pangkwalipikasyon. Sa unang pagsubok, tatlumpung (30) mag-aaral na nasa programang Edukasyon na nagnanais magpakadalubhasa sa Filipino ang siyang kalahok nito Binigyan lamang sila ng tatlong oras para tapusin ang pagsusulit na ito. Papaalalahanan sila ng mga mananaliksik na sagutan ang lahat ng mga aytem. Ito'y alinsunod sa sinabi nina Rose at Stanley (1967) na sa pagsubok na pagsusulit o try out test, kinakailangang huwag mag-iwan ang mga kalahok ng mga aytem ng walang sagot sapagkat makakapaekto ito sa proseso ng balidasyon.

Ang mga sagutang papel mula sa mga kalahok ay kinolekta. Iwinasto ito at binigyang puntos ayon sa inilatag na rubrik. Ang pinakamataas na iskor na iskor na maaaring makuha ng kalahok sa pagsusulit na ito ay isandaan (100) samantalang 0 naman ang pinakamababa. Inayos ang papel mula sa pinakamataas na iskor hanggang sa pinakamababa. Inihiwalay ang mataas na 27% sa mababang 27%. Kinuha ang bahagdan ng wastong sagot. Binawas ang bahagdan ng wastong sagot na nasa mababang pangkat sa wastong sagot na nasa mataas na pangkat. Ang resulta ay ang siyang indeks ng deksriminasyon. Ginawang basehan ang interpretasyon ni Ochave, et al (1998) sa pag-interpreta sa naitalang antas ng deskriminasyon.

Indeks ng Deskriminasyon	Ebalwasyon ng Aytem
. 40 pataas	Napakahusay na Aytem
. 30 - . 39	Mahusay na Aytem
. 20 - . 29	Marginal na Aytem at Nangangailangan ng Rebisyon
. 19 pababa	Mahinang Aytem

Pinapakita lamang ng talahanayan na nasa itaas na ang aytem na may antas na deskriminasyon na mababa sa 30% ay nararapat alisin o kaya'y palitan.

Sa pagtukoy kung ang isang aytem ay pananatilihin, irerebisa o papalitan, Ginawang basehan ang interpretasyon nina Oriondo at Dalo Antonio (1984) sa pag-interpreta sa naitalang antas ng kahirapan.

Indeks ng Kahirapan	Interpretasyon
00 - . 20	Sobrang Hirap
. 25 - . 80	Katamtamang Hirap
. 81 – 1.0	Sobrang Dali

Upang makuha ito, sinunod ng mga mananaliksik ang pormolaryong ito:

$$Df = \frac{\text{mataas na pangkat + mababang pangkat}}{2}$$

Layon ng unang pagsubok na sukatin ang antas ng kahirapan at deskriminasyon ng mga aytem. Layon din nitong alamin kung may kalabuan (ambiguity) ang mga aytem at angkop ang gamit ng wika sa pagsusulit.

Ikalawang Pagsubok (Second Try out)

Matapos ang unang pag-analisa sa mga aytem, marebisa at mapalitan ang mga ito, isinagawa ng mga mananaliksik ang ikalawang pagsubok. Ipinasubok ang ikalawang burador ng pagsusulit sa tatlumpu (30) ulit na mag-aaral na nasa Unang Taon na nasa programang Edukasyon na nagnanais magpakadalubhasa sa Filipino. Ang proseso ng pamamahagi ng pagsusulit sa ikalawang pagsubok ay katulad lang din sa unang pagsubok. Gayundin ang pag-aanalisa ng mga aytem nito.

Layon ng ikalawang pagsubok na alamin kung ang mga nirebisa at pinalitang aytem ay nagkaroon ng development pagdating sa antas ng kahirapan at antas ng deskriminasyon.

Ikatlong Pagsubok (Third Try out)

Ayon kina Oriondo at Dallo Antonio (2004), bago ibigay ang pinal na burador ng pagsusulit ay kailangang gawin muna ang una at ikalawang pagsubok nang sa gayon ay maging balido ang binuong pagsusulit, bagay na siya namang ginawa ng mga mananaliksik.

Ito ay pinasagutan sa labinlimang (15) mag-aaral na nasa Ikalawang Taon na Nagpapakadalubhasa sa Filipino ng nasabing kolehiyo. Ang proseso ng pag-aadminister ng pagsusulit sa huling pagsubok ay katulad lang din sa una at ikalawang pagsubok. Gayundin ang pag-aanalisa ng mga aytem nito.

Pagsusuri ng mga Datos

Matapos maihanda ang pinal na porma ng nabuong pagsusulit, tinukoy ang relayabiliti ng nabuong pagsusulit sa pamamagitan ng prosesong Test Retest Method at paggamit ng pormularyong Kuder-Richardson Formula #21. Ginamit ang mga ito upang matukoy ang konsistensi ng mga nakuhang iskor ng mga mag-aaral sa ginawang pagsusulit. Tinukoy din ang baliditi ng gagawing pagsusulit sa pamamagitan ng pagtukoy sa content validity, construct validity at concurrent validity nito.

Mga Posibleng Isyung Etikal

Nilalaman ng bahaging ito ang pagsasaalang-alang sa mga sumusunod na indibidwal, institusyon at instrumentong gagamitin na siyang magiging kabahagi ng gagawing pananaliksik:

Una na riyan ay ang Kolehiyo ng Eulogio Amang Rodriguez Institute of Science and Technology na kung saan gaganapin ang pagsubok sa pagsusulit. Napili ito ng mga mananaliksik bilang lugar na pagsusubukan ng pagsusulit sapagkat dito siya nagtuturo. Malaking bagay ito upang mapadali at maging kumbyente ang proseso ng pag-aadminister ng pagsusulit at balidasyon nito. Ang mga mananaliksik ay sumulat ng isang liham pahintulot sa pamunuan nito sa paggamit ng kanilang paaralan bilang lugar ng pagsusulit.

Pangalawa, ang mga kalahok na nasa Unang Taon na kumukuha ng programang Edukasyon na nagnanais magpakadalubhasa sa Filipino at Ikalawang Taon na Nagpapakadalubhasa sa Filipino. Pinaalalahanan ang mga napiling kalahok na may kalayaan sila kung magiging kabahagi ng pananaliksik o hindi. Tiniyak sa kanila na hindi makokompromiso ang kanilang kaligtasan sa oras na ito'y magsimula at matapos. Ipinabatid sa kanila ang oras na nakalaan sa pagsagot ng pagsusulit nang sa gayon maiwasan ang pag-ayaw ng mga mag-aaral bilang kalahok sa kalagitnaan ng pagsusulit. Bago nagsimula ang pagsusulit, sinabi sa kanila ang layunin nito. Ipinaliwanag na ang resultang markang makukuha nila ay hindi makaaapekto sa magiging grado nila sa anumang mga asignatura nila sa Filipino. Ang pagkakakilanlan ng bawat kalahok ay pinanatiling lihim ng mga mananaliksik. Ang mga kalahok ay binigyan ng karapatan na malaman ang resulta ng kanilang pagsusulit. Ipinabatid sa kanila ito ng mananalisik nang personal at lihim upang maiwasang mailagay sa kahihiyan ang bawat kalahok.

At ang huli, ang mga pag-aaral, talatanungan o questionnaire, teksto at iba pang mga instrumentong ginamit sa pagbuo ng pagsusulit na ito. Binigyan ng mga mananaliksik ng karampatang pagkilala ang mga eksperto at mananaliksik na gumawa o nagsulat nito.

RESULTA AT DISKUSYON

Sa isinagawang pag-aaral, lumabas na:

1. Sa unang pagsubok, ang gawain sa pakikinig (bahagi 1) ay nakapagtala ng 0.30 na indeks ng kahirapan at 0.21 na indeks ng deskriminasyon. Batay sa inilatag na interpretasyon, ang gawain/aytem na ito ay nararapat rebisahin. Samantala, ang gawain sa pagsulat ay nakapagtala naman ng 0.18 ng ineks ng kahirapan at 0.17 na indeks ng deskriminasyon. Nangangahulugan naman ito na ang aytem ay nararapat palitan. Sa ikalawang pagsubok, ang nirebisang gawain sa pakikinig (bahagi 1) ay nakapagtala ng 0.27 na indeks ng kahirapan at 0.31 na indeks ng deskriminasyon. Nangangahulugang ito na ang gawain ay isang mahusay na aytem. Samantala, ang pinalitang gawain sa pagsulat ay nakapagtala ng 0.25 na ineks ng kahirapan at 0. 32 na indeks ng deskriminasyon. Nangangahulugan naman ito na ang gawain ay isang mahusay na aytem. Sa ikatlong pagsubok, lumabas na ang lahat ng gawain ng pagsusulit ay maituturing ng mahusay na aytem, ito'y batay na rin sa naitalang indeks ng kahirapan at indeks ng deskriminasyon nito.

2. Batay sa isinagawang content validity ng mga mananaliksik, lumabas na ang nabuong pagsusulit ay sumasaklaw sa nilalaman na nararapat nitong tayain. Sa isinagawa namang concurrent validity, lumabas na ang pagsusulit ay isang balidong instrumento sa pagsukat sa magiging pagganap ng mga mag-aaral sa oras na matanggap sila sa kursonf

Batsilyer sa Pansekundaryang Edukasyon sa Pagtuturo ng Filipino. Sa isinagawang test retest ng mga mananaliksik at paggamit ng estatetikal na pamamaraang Kuder Richarson #21, lumalabas na ang ginawang pagsusulit ay relayabol.

3. Ang pagsusulit pangkwalipikasyon ng mga mananaliksik ay mayroong 100 aytem na nahahati sa limang komunikatibong bahagi: pakikinig, pagsasalita, pagbasa, panonood at pagsulat. (Tingnan ang apendeks).

REKOMENDASYON

Sa pag-aaral na ito, iminumungkahi ng mga mananaliksik ang mga sumusunod:

1. Gumamit ng ibang teoryang komunikatibo bilang saligan. Maaring gamiting ang kay Bachman at Palemer (1986) o dili kay Marquez (1996).

2. Maaring gumawa ng pagsusulit na nakatuon lamang sa isang kasanayan. Halimbawa – pakikinig.

3. Maaring gumawa ng pagsusulit na nakatuon naman sa ibang layunin. Hal: dayagnostik na pagsusulit, pagsusulit sa natamong kabatiran, atbp.

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ONLINE PREPAREDNESS FOR SCIENCE TEACHERS IN HIGHER EDUCATION

Norma Jean J. Besana

INTRODUCTION

The recent development in technology provides an overwhelming growth of distance learning in different countries which contributed to the acceleration of education for all. Changing environment nowadays encourage educational institutions to seek additional platforms in continuing to provide quality education. Open and distance learning is a way of delivering education through the use of technology such as the interconnected network. The future is clear in education sector that technology will play a primary role in the future. As far as education is concern, teachers are the main assets of the academe, where they are the one responsible in building the knowledge. According to Dr. Bandalaria (Dela Pena-Bandalaria, 2009) of University of the Philippines, Open University, defined distance education as the online delivery of instructional content as well as associated support services to students in the absence of physical, this shows that online delivery of instruction thru online can be consider as a primary way of teaching and learning. The Department of Education strategy plan emphasized the need to develop learning via its 5-year Information and Communication Technology for Education (ICT4E) Strategy Plan. It aims to integrate ICT into every school curricula, develop programs, establish infra and come up with a system. While there is a strategic plan of the department, it is essential to monitor the implementation of the program. One problem that encountered by the department is the low student-computer and teacher computer ratios that pose the biggest challenge to the program (Dimasuay & Pabro, 2009; Melinda dela PenaBandalaria, 2011). Several studies were conducted regarding the preparedness of teachers in online learning and teaching. In turkey, one study revealed that teachers' overall technology readiness level was moderate and there are no significant differences in terms of readiness in technology across age and subject area of the teachers but significant difference between technology in preparedness and gender (Summak, Bağlibel, & Samancioğlu, 2010). The Department of Education's advocacy on computerization may contribute to the attitude of the teachers in online education, as one study conducted that organizational preparedness factors have the most important effect on e-Learning outcomes. It was also reveal in one study that teachers' motivation and training is the most important factor in e-Learning. (Hung, 2016)

Statement of the Problem

This paper will answer the following question:

(1) What is the profile of the respondents in terms of: age, gender, level of educational attainment; years of teaching, and rank;

(2) What is the level of preparedness of the Teachers in Open and Distance Teaching?; and

(3) Is there a significant difference on the level of preparedness in EARIST General Education in Teaching across the profile of the respondents?

The significance of the Study

Open and distance education is the future of learning. It will also make the learning faster and efficiently in the own face of a student. It provides convenience to both learners and teachers. It is essential that the science teachers be ready for the change in technology. Despite the reality that the Philippines is still slow in internet connectivity (Euromonitor, 2016; Mak et al., 2014), readiness is essential for preparation. This study is significant to determine the preparedness of the teachers in higher education in the Science department in EARIST Manila. Findings of this study will be helpful for both practitioners and academics of ELearning systems.

Methods

In this research study, the researcher adopted a quantitative method of research. It used the survey as a method of data collection that has gained popularity over the years because of a great deal of valuable information on what people think. Also, it is more common to use e- questionnaires because it yields information that is more systematic for all participants.

Sources of Data

The employed science teachers in higher education of science department, EARIST, Manila were the sources of data for this study. Have a total of 6 science teachers in higher education department and is one component of EARIST.

100 percent participants were requested to complete the survey within one term from the date of issuance of the questionnaire. The researcher shortens the link and adopted survey questionnaire using Google form and extracted format for evaluation.

Statistical Treatment

Used Frequency and Percentage were used in the first problem which is the profile of the respondents. Average weighted mean was also used in determining the interpretation based on the Likert rating scale used in the level of preparedness in teaching environment.

Likert Rating

Scale	Range	Interpretation
5	4.51 - 5.00	Extremely Agree
4	3.51 - 4.50	Agree
3	2.51 – 3.50	Neutral
2	1.51 – 2.50	Disagree
1	1.00 – 1.50	Extremely Disagree

To obtain the significant difference between two variables, a correlation was also used and measured significant difference using ANOVA. In order to simplify statistical computation, all data was inputted into the software SPSS for faster analysis of data.

RESULTS AND DISCUSSION

Results generated by the Google Forms were extracted to CSV format. The result of the study is shown.

Table 1
Profile of the Respondents

Variables	Categories	Frequency	Percentage
1. Age	21 – 30 Years Old	1	16.66
	31 – 40 Years Old	2	33.33
	41 – 50 Years Old	2	33.33
	51 – 60 Years Old	0	0.00
	61 – Older	1	16.66
Total		**6**	**100.00**
2. Gender	Male	2	33.33
	Female	4	66.67
Total		**6**	**100.00**
3. Faculty Rank	Instructor	3	50.00
	Assistant Professor	2	33.33
	Associate Professor	1	16.67
	Professor	0	0.00
Total		**6**	**100.00**
4. Years in Service	1 – 10	2	33.33
	11 – 20	2	33.33
	21 – 30	1	16.67
	31 – 40	1	16.67
Total		**6**	**100.00**

As shown in the table, the profile of the respondents revealed that both categories have the same of frequency with both 16.66%. While on gender, 66.66% of the respondents are female; this indicates that most of the science teachers are female. And the number of years in service, by 10 to 20 years in service shows the majority frequency with 33.33 %.

Instructors consists the most numbers of respondents with 50.0%; followed Assistant Professor with 33.33% and Associate Professor with 16.67%.

Summary of the “Online Preparedness for Science Teachers in Higher Education, EARIST,”

For the technical skills of teachers, most of the respondents believed that they are ready and competent regarding technological and technical skills with a weighted mean of 3.97.

For an experience in online teaching and learning, most of the respondents are neutral with a weighted mean of 3.18. Even there is a neutral experience in online learning, the attitude of the teachers are confident and Agree with a weighted mean of 3.99. The result of the study

shows that teachers are ready in online teaching despite the result that they have limited experience in online teaching. This is because of non-exposure of science teachers in online education and the Department of Education has not yet fully provided guidelines and policies for online learning. The result of this study agrees with several studies that teachers are more likely ready in embracing online education (Downing & Dyment, 2013; Eslaminejad, Masood, & Ngah, 2010; Hung, 2016).

Technical Skills of science teachers are acquired due to the computerization project of the Department of Education and the improvement of technology in the Philippines (Alampay, 2006; Espinosa & Caro, 2011; Lorenzo, 2016). Teachers are known as responsive individuals, despite of low salary (Tucay, 2015), they have positive attitude towards online teaching because of the use of blended learning approach (Jeffrey, Milne, Suddaby, & Higgins, 2014) and the use of social media in education (Gikas & Grant, 2013; Samuel, 2012). The Philippines is still currently embracing technology in the application of online education, even prominent universities propose researches to help the government schools to adopt online education for policy formulations toward inclusive education, and some top university discusses issues in the implementation of online education (Arinto, 2016). Some state university in the Philippines are adopting free platform as a start in distance learning but contains limitations, unlike the full-blown platform which is Moodle. It is advised that teachers should attend webinars about online learning for preparedness.

While teachers may not have a highly experienced in online learning, teachers attitude are a contributing factor for the future of learning in the Philippines.

Limitations of the Study

The scope of the study is in General Science Department unit as part of EARIST, State College. Science teachers were the respondents of this study with a total of 6 science teachers in higher education from EARIST, Manila. The respondents of this study with a total of

CONCLUSIONS AND RECOMMENDATIONS

This study concludes that the majority of the respondents are ready for online teaching. Despite the neutral experience in online teaching, the attitude of the teachers in Science Department is positive that contributes to the preparedness of teachers. It is recommended that the Department of Education should focus on long-term implementation to support the growing need for distance learning and technological adaptation. Also, State University and Colleges in the Philippines should help the schools thru extension project to help the school to promote learning because the presence of technology cannot be utilized without knowledge and acceptance of technology towards online education.

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MARINE SANCTUARY PRESERVATION PROGRAM IN MABINI, BATANGAS

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INTRODUCTION

The Philippines is rich in natural resources. Therefore, to maintain their richness, people should be disciplined and well-oriented in preserving our environment. Environmental Preservation is the strict setting aside of natural resources to prevent the use or contact by humans or by human intervention. In terms of policymaking, this often means setting aside areas as wildlife reserves, parks, or other conservation areas. Marine Sanctuaries in the Municipality of Mabini in Batangas City are part of the Marine Protected Areas. Marine Protected Area (MPA) is essentially a space in the ocean where human activities are more strictly regulated than the surrounding waters. These places are given special protections for natural or historic marine resources by local, or national authorities. Tools such as regulations, zonal plans, outreach and education, and research and monitoring are largely focused on a sanctuary and its surrounding areas.

Mabini is a first-class municipality in the Province of Batangas, Philippines, named after Apolinario Mabini, a Filipino revolutionary hero. It has a beautiful marine sanctuary that consists of different fish species, majestic coral reefs, and other water creatures. The primary objective of a sanctuary is to protect its natural and cultural features while allowing people to use and sustainably enjoy the ocean.

Bantay-Dagat also is known as Sea Patrol are a community- based volunteer organization in the Philippines that work with local and national government officials and within 15 kilometers of the shore to protect the marine environment against illegal fishing and rescue operations. Bantay-dagat is a participatory approach designed for coastal law enforcement which has existed in the Philippines since the 1970s. Marine sanctuary in the municipality of Mabini in Batangas City protects coastal resources. This sanctuary represents commendable efforts by the coastal communities, government agencies, and non-government partners. People in general, visitors or local residents alike, can help preserve marine life by strictly following rules and regulations of the local government. Although local businesses provide a boost in tourism and income for people, they also have to make sure that each business implements strict regulations in preserving the marine sanctuary. Awareness is important to preserve the natural existence of these creatures and be able to sustain it for more generations to come."

This study was conducted to determine the ways of the government and local community on preserving the Marine Sanctuaries in the municipality of Mabini, and how they implement their rules and regulations for tourists, resorts, and local residents. Another, to witness the beauty of marine life in Mabini and why are they popularly known as one of the best diving places in the Philippines and also, to support and promote the tourism industry in Mabini, Batangas.

METHODOLOGY

This study utilized the descriptive method of research since it established to gather information and established the Marine Sanctuary Preservation in Mabini, Batangas. Descriptive research is devoted to the gathering of information about prevailing conditions or

situations for description and interpretation. This type of research method is not simply amassing and tabulating facts but includes proper analyses, interpretation, comparisons, identification of trends, and relationships. The respondents were sampled and described to the selected variables to present their profiles. The study headed in the Municipality of Mabini in Batangas City.

Purposive sampling is a non-probability sampling that is selected based on the characteristics of a population and the objective of the study. Purposive sampling is also known as judgmental, selective, or subjective sampling. Purposive sampling because the respondents were chased based on their knowledge of the information desired. The respondents were consisted of twenty (20) Coast Guard/Bantay Dagat, twenty (20) Local Government Unit, and sixty (60) Community Residents. They were classified according to the following categories: gender, age, civil status, and educational attainment. The respondents assessed and answered the questionnaires specifically and respectively.

RESULTS AND DISCUSSION

Sub Problem No. 1: How do the Coast Guard/ Bantay Dagat, Local Government Unit, and Community Residents assess the Marine Sanctuary Preservation Program in the Municipality of Mabini, Batangas?

Table 1
Assessment of Marine Sanctuary Preservation Program in the Municipality of Mabini, Batangas

Criteria	Coast Guards/ Bantay Dagat		LGU Employees		Community Residents		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
1. Jet Skis are prohibited.	4.05	VG	4.00	VG	3.90	VG	3.98	VG	4
2. No fishing, scuba spearfishing, collection of marine flora and fauna, collecting or vandalizing of corals.	3.95	VG	3.35	G	3.57	VG	3.62	VG	9
3. No anchoring of ship or boats to the sea bottom.	4.25	E	3.45	VG	3.42	VG	3.71	VG	8
4. Underwater structures are not allowed.	4.10	VG	3.70	VG	3.43	VG	3.74	VG	7
5. Designated areas for the activities for visitors like scuba diving, snorkeling, and boating.	4.65	E	4.44	VG	4.55	E	4.55	E	1
6. Catching of charismatic species (frogfish, pipefish/ and seahorse) are prohibited.	4.40	E	3.60	VG	3.70	VG	3.90	VG	5
7. Bantay Dagat 24-hour watch on Philippine coastal waters 15 kilometers away from shore.	4.50	E	4.00	VG	3.98	VG	4.16	VG	3
8. Bantay Dagat is using the Global Positioning System (GPS) to monitor and apprehend illegal fishermen.	4.55	E	3.70	VG	3.15	G	3.80	VG	6
9. Annual coastal clean-up in the sanctuary area.	4.90	E	4.35	E	4.25	E	4.50	E	2
Overall Weighted Mean	**4.37**	**E**	**3.84**	**VG**	**3.78**	**VG**	**4.00**	**VG**	

Legend:

Scale	Range			Verbal Interpretation	Symbol
5	4.20	-	5.00	Excellent	E
4	3.40	-	4.19	Very Good	VG
3	2.60	-	3.39	Good	G
2	1.80	-	2.59	Fair	F
1	1.00	-	1.79	Poor	P

Table 1 manifested the assessment of the Marine Preservation Program in the Municipality of Mabini, Batangas were rated as Highly Implemented with an overall composite weighted mean of 4.88. Two (2) items were rated as Excellent, namely: The activities for visitors were scuba diving, snorkeling, and boating with a composite weighted mean of 4.55 as rank 1; and Annual coastal clean-up in the sanctuary area with a composite weighted mean of 4.50 as rank 2. Seven (7) items were rated as Very good, such as Bantay Dagat keep a 24-hour watch on Philippine coastal waters 15 kilometers away from shore with a composite weighted mean of 4.16 as rank 3; Does not allow passage of Jet Ski with a composite weighted mean of 3.98 as rank 4; Does not allow catching of charismatic species (frogfish, pipefish/ and seahorse), with a composite weighted mean of 3.90 as rank 5; Bantay Dagat is using Global Positioning System (GPS) to monitor and apprehend illegal fishermen with a composite weighted mean of 3.80 as rank 6; Does not allow putting up of any underwater structure with a composite weighted mean of 3.74 as rank 7; Does not allow anchoring of ship or boats to the sea bottom with a composite weighted mean of 3.71 as rank 8; and Does not allow fishing, scuba spearfishing, collection of marine flora and fauna, collecting or vandalizing of corals with a composite weighted mean of 3.69 as rank 9.

As to the groups of respondents' assessment on the Marine preservation Program in the Municipality of Mabini, Batangas were as follows: coast guards/ bantay dagat were rated as Excellent with a composite weighted mean of 4.37; LGU's were rated as Very good with a composite weighted mean of 3.84, and community residents were rated as Very good with a composite weighted mean of 3.78.

Sub Problem No. 2 Is there a significant difference in the assessment of the three groups of respondents on the Marine Sanctuary Preservation Program of Mabini, Batangas

Table 2
Comparison of Assessment on the Marine Sanctuary Preservation Program of Mabini, Batangas

df	Mean of Sum Square	F-value	critical value	Decision	Interpretation
97	Between: 0.107463 Within: 6.687487	0.016069	3.07	Accept Ho	Not Significant

Legend: @0.05 level of significance

As depicted in Table 2, the computed F-values on the Marine Sanctuary Preservation Program of Mabini, Batangas as assessed by Coast Guards/Bantay Dagat, LGU employees, and community residents is 0.016069 which is lower than the critical value of 3.07 with the degree of freedom of 37 at 0.05 level of significance. Hence, there is no significant difference on the assessment of the Marine Sanctuary Preservation Program of Mabini, Batangas. Therefore, the hypothesis is accepted.

Sub Problem No. 3: **What are the Problems Encountered by the respondents?**

Table 3
Problems Encountered in the Assessment of the Marine Preservation Program in the Municipality of Mabini, Batangas

Criteria	Coast Guards/ Bantay Dagat		LGU Employees		Community Residents		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
1. Fishermen that use small- scale nets in catching some fish.	3.45	E	3.80	E	4.15	E	3.80	E	7
2. Fishermen practice dynamite fishing.	3.60	E	3.77	E	4.20	HE	3.86	E	5
3. Fishermen that use traditional spearfishing.	3.44	E	3.98	E	4.66	HE	4.03	E	1
4. Residents are throwing waste in sanctuary areas.	3.50	E	4.00	E	4.02	E	3.84	E	6
5. Boats anchoring on the bottom of the sea.	3.65	E	4.02	E	4.14	E	3.94	E	3
6. Jet Skis are passing through the sanctuary area.	3.99	E	3.85	E	4.00	E	3.95	E	5
7. Tourists collecting corals and other marine species.	3.45	E	3.50	E	3.98	E	3.64	E	8
8. No annual lean-up happening in the sanctuary area.	3.65	E	3.79	E	4.35	HE	3.93	E	4
Overall Weighted Mean	**3.60**	**E**	**3.84**	**E**	**4.19**	**E**	**3.87**	**E**	

Legend:

Option	Range			Verbal Interpretation	Symbol
5	4.20	-	5.00	Highly Encountered	HE
4	3.40	-	4.19	Encountered	E
3	2.60	-	3.39	Moderately Encountered	ME
2	1.80	-	2.59	Least Encountered	LE
1	1.00	-	1.79	Not Encountered	NE

Table 3 portrayed the Problems Encountered on the Assessment of Marine Preservation Program in the Municipality of Mabini, Batangas were rated as Encountered with an overall composite weighted mean of 3.87. All items were rated as Encountered, such as There were fisherman that use traditional spearfishing with a composite weighted mean of 4.03 as rank 1; There were still passage of Jet Ski on the sanctuary area with a composite weighted mean of 3.95 as rank 2; There were still boats anchoring on the bottom of the sea with a composite weighted mean of 3.94 as rank 3; There is no annual clean-up happening in the sanctuary area with a composite weighted mean of 3.93 as rank 4; There is still fishermen that want to dynamite fishing with a composite weighted mean of 3.86 as rank 5; Community residents are throwing waste in sanctuary areas with a composite weighted mean of 3.84 as rank 6; There were still fishermen that use small-scale nets in catching some fish with a composite weighted mean of 3.80 as rank 7, and There were still tourists collecting corals and other marine species with a composite weighted mean of 3.64 as rank 8.

Likewise, the groups of respondents' assessment on the Assessment of Marine Preservation Program in the Municipality of Mabini, Batangas were as follows: community residents were rated as Encountered with a composite weighted mean of 4.19; LGU's were rated as Encountered with a composite weighted mean of 3.84, and coast guards/ bantay dagat were rated as Encountered with a composite weighted mean of 3.60.

CONCLUSIONS, AND RECOMMENDATIONS

Based on the findings of the study, the following conclusions are drawn:

1. The respondents' assessment on the Marine Sanctuary Preservation Program in the Municipality of Mabini, Batangas was Very Good.

2. The Coast Guards/Bantay Dagat, LGU employees, and community residents shared a common assessment on the Marine Sanctuary Preservation Program in Mabini Batangas.

3. There were problems encountered by the respondents as to the marine sanctuary program.

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

1. The Coast Guards/ Bantay Dagat, Local Government Units, and the Community Residents may work together in the Preservation Program of Marine Sanctuary in the Municipality of Mabini, Batangas to attain excellent rating.

2. There should be unified action by the Coast Guards/ Bantay Dagat, Local Government Units, and Community Residents in addressing the issues relevant to preserving the marine sanctuary area.

3. Identified or cited problems should be given utmost importance and attention as these affect negatively in the Preservation of Marine Sanctuary in Mabini, Batangas, these problems are the fishermen who use small nets for fishing, residents throwing waste in the sanctuary area, and the dynamite fishing.

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PREFERRED LEARNING STYLES AND PERFORMANCE IN FILIPINO OF BSE FILIPINO II: BASIS FOR STRATEGIC PLAN

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INTRODUCTION

Learners of today, act, learn and behave differently. The rapid change in technology have greatly influence their lifestyles, their attitude, their wants, the kinds of music the learners listen, the dance, the instruments and technology that carries the music, the TV shows that they patronize, the games they play, the language they use. The way they learn and assimilate ideas are affected by their styles of learning and preferences. The world now is truly technology driven, where instead of being a mere tool for civilization, it poised to become its master.

Every learner is unique and has genuine potentials. They learn in different ways, learn according to the manner they can best absorb and acquire concepts; they have their own way of gaining knowledge and skills which we commonly called as learning styles. Every learner differs as regards to what mode of instruction or pedagogy is most effective for them. This learning style will guide them in the process and how they will learn. Just like older folks learners have different methods of interacting with, taking in, and processing stimuli or information. Enthusiasts of learning styles claim that everyone has a preferred style, so teachers must observe very keenly and be very sensitive to where children learn better to determine their preferences. Having established those preferences will help teacher understand their learners and why they act that way. It will help them recognize, acknowledge and respect the learning learners' innate tendencies called style of learning. Thus, every learning style should be given emphasis by every learning facilitator when designing and providing learning experiences.

Teachers must be aware of the learning style of learners, so they can apply multimodal learning or strategies that benefit everyone. Learners may learn best by listening, some by mere observing every step, while others have to be involved, perform or work with it to learn. Learning styles will keep learners engaged; they will not get bored, but feel excited and motivated through the learning process if they are allowed to work on their own preferred style.

Knowledge about the learners' learning styles will be helpful for teachers. It assists them in planning their learning and developing strategies that cope with different learning situations in order to make learning more meaningful and effective. It encourages them to use methods, arrange materials and engage the learners in activities that meet their needs and accommodate various learning styles. It helps them reconsider learning problems resulting from the mismatch between learners' learning styles and teaching methods.

The researcher observed that her learners in her four years of teaching learned in different ways. She discovered that most of her learners went to school without taking enough food for their breakfast due to rampant poverty in the barangay. Learners could no longer respond to the particular stimulus about the learning that they need to adopt or absorb. There are cases of misbehavior due to "broken family" or neglected children where they were under the custody of their grandparents. The attitudes shown in the school reflects their practices at home.

In our daily learning activities, some learn best when working with the group, while others grasp ideas easily when studying alone. Some learns even learn when there is noise while others are easily distracted by it. There are also learners who cannot concentrate when the weather is warm, and there are learners who prefer doing a task alone while others enjoy doing with others. There are some who prefers to observe only when there are activities; but there are also some who wants to directly engage in the tasks.

This situation motivated the researcher to conduct this study. She wants to help improve the performance of her learners in Filipino using different styles and strategies to identify her learners' weaknesses and proposed a remedy on how teachers can manage the varied learning styles and implementing CHEd's program, psychological and emotional needs by giving them enough attention, love and care, and the proper guidance.

This study also looked into the suitability, acceptability and feasibility of the proposed training plan.

Statement of the Problem

This study determined the effect of preferred learning styles on achievement of BSE FILIPINO II students of College of Education, Eulogio "Amang" Rodriguez Institute of Science and Technology (EARIST).

Specifically, it sought to answer the following questions:

1. What is the performance of the BSE Filipino II students in Filipino for the past three years?

2. What learning styles preferences of the learners are exhibited in terms of:

    2.1. Environmental preferences;

    2.2. Attitude or emotions preferences;

    2.3. Sociological preferences;

    2.4. Physiological preferences; and

    2.5. Psychological preferences?

3. Is there a significant relationship between learning styles and performance of BSE Filipino II students in Filipino?

4. What are the problems encountered by the teacher respondents?

5. Based on the result, what strategic plan may be recommended?

Conceptual Framework

The conceptual framework of this study is anchored on the system approach using the Input, Process, Output model as shown in Figure 1 below.

Figure 1 shows the systems approach use in the study.

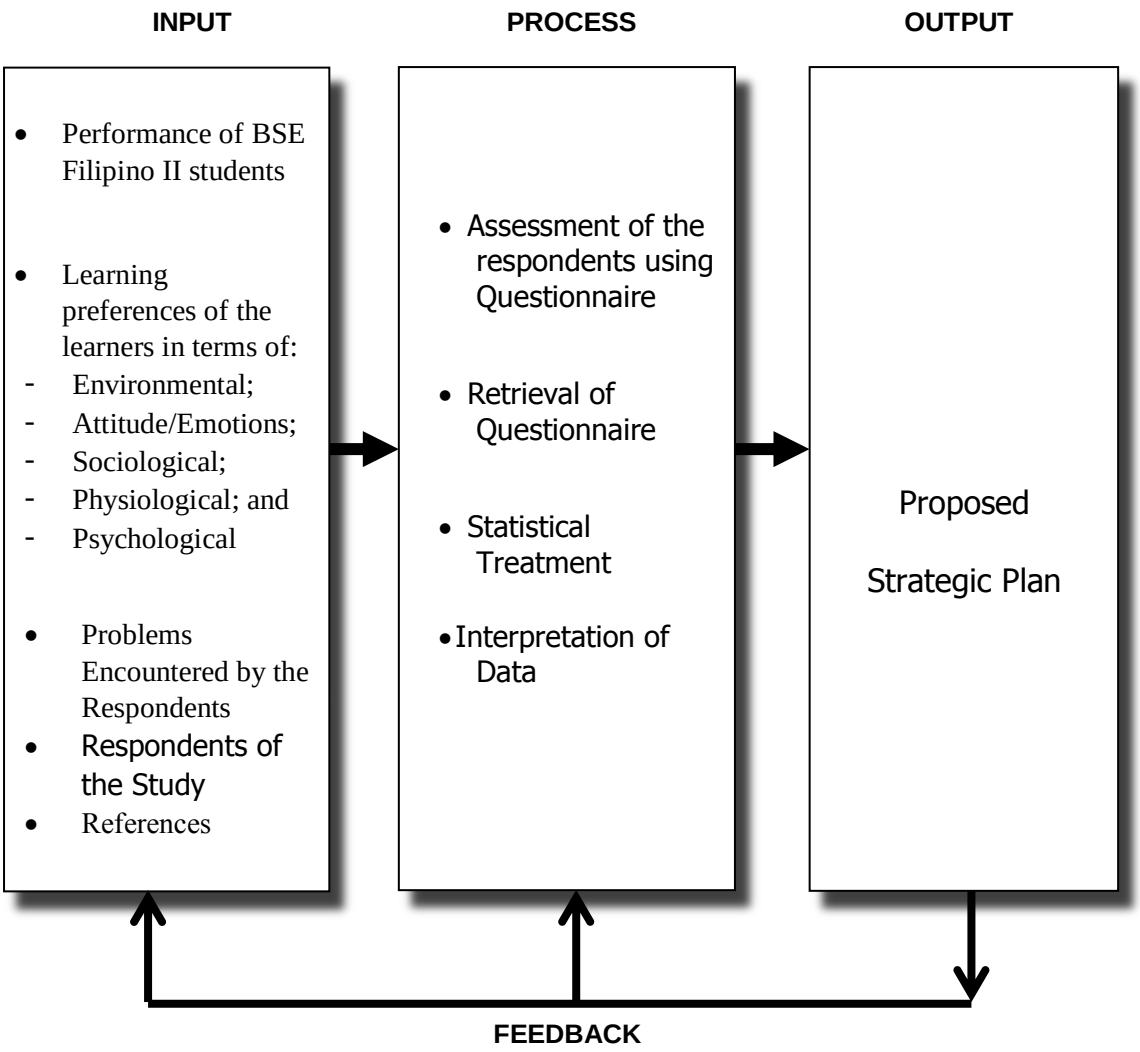

Figure 1. Paradigm of the Study

The **INPUT** are the preferred learning styles of BSE-Filipino II students in terms of: environmental preferences, attitude/emotion references, sociological references, physiological references and psychological references; performance of BSE-Filipino II students in Filipino for the last three years 2017-2020; problems encountered by the respondents; respondents of the study and references.

The **PROCESS** contains the assessment on environmental preferences, attitude/emotion references, sociological references, physiological references and psychological references statistical treatment of data and analysis and interpretation of data.

The **OUTPUT** is the proposed strategic plan.

Objective of the Study

The primary aim of this study was to determine the effect of preferred learning styles on academic achievement of BSE FILIPINO II students to recommend what intervention maybe proposed.

Significance of the Study

The results of the study would be beneficial to the following:

BSE-Filipino Students. The result of the study should reveal the different learning styles and therefore develop awareness about their own learning styles. If they learn what type of learner they are, they can have a clearer picture of the learning process, and more consciousness of learning. With more consciousness of learning style, they may understand why they feel comfortable in learning one aspect while uncomfortable in learning another.

Faculty. The findings of the study should give awareness to the teachers about the Learners' different learning styles. Knowledge of the Learners' learning styles was guiding them in utilizing teaching methods and strategies to address their needs. We have to adapt different teaching methods and we have to find out a balanced teaching approach.

College Dean. The results of the study should give information to the administrators about the Learners' different learning styles. Therefore, suggestions can be given to upgrade the quality of instruction to ensure that the teaching strategies are suited to address learners' needs.

Future Researchers. The result of this research can serve as reference for future researchers in pursuing similar study.

REVIEW OF THE LITERATURE and STUDIES

Tenedero (2018) in his article "Different Kinds of Learning Defined", he shared some research-based learning styles model which can contribute in improving the quality of education. These are as follows: Cognitive Style Profile, Cognitive Style Delineators, Paragraph Completion Method, Child Rating Form, Gregorc Style Delineator and Inventory of Learning Processes. The Cognitive Style Profile has fifteen qualitative elements which include empathy, proxemics and proprioceptivity. The secondary category corresponds to logical thinking, contrasting and comparison, relationships between measures and hypothesis development. Cognitive Style Delineators is based on the assumption that learning is an information processing activity which involves storage and retrieval of information.

Paragraph Completion Method developed by Dr. David Hunt (2009) categorized learners as impulsive, dependent and independent. Child Rating Form defined learning styles in terms of the cognitive style dimension of field dependence or independence and cultural differences. Gregorc Style Delineator enumerates four learning patterns: concrete sequential, concrete random, abstract sequential and abstract random. Concrete sequential appreciate order and direct step-by-step instruction while concrete random have experimental attitudes and behaviors. Abstract sequential learn better from authorities than through active experimentation while abstract random are interested in discussions and activities involving multi - sensory experiences.

Psychologically, Katherine Benziger's Theory on Personality Assessment, Thinking and Working Styles (2011) posits that the brain has four specialized areas and each is responsible

for different brain functions. The specialized areas are called 'modes' as follows: mode 1 - basal left which gives good routine, sequential and process skills, follows instructions, does things by the book, step-by-step and communicates in writing detailed; mode 2 strong basal right have good active listening skills, understands how people feel, sensitive, picks up moods and feelings; mode 3-strong frontal right can visualize, conceptualize, able to grasp whole pictures, themes, from vague outlines or ideas; and mode 4 strong frontal left gives good analytical skills and are good at mathematics.

Yamazaki (2015) stated that it has been found that students' learning styles do significantly influence their academic achievement; these findings are based on research conducted in other countries and vary depending on the country. A country never stops to explore and develop its own methods of learning in order to respond to the demands particular to its environments.

According to Zhang (2015), the basic principle is that, in order for students to benefit maximally from instruction and assessment, at least some of each should match their learning styles. Therefore, flexibility is crucial for students as well as for teachers.

According to Trezise (2017) classrooms are emotional settings. Students' emotional experiences can impact on their ability to learn, their engagement in school, and their career choices. Yet too often education research ignores or neutralizes emotions. To improve students' learning and emotional states, reduce teacher burden, and further develop of emotion and learning theories, research efforts should turn to explore how students can learn regardless of their emotional state.

According to Dunn and Dunn learning styles model (2016) environmentally students like to learn to the physical environment that is most conducive to learning. Child needs quiet, ensure that there is some quiet space at home or in the classroom, or try out headphones to minimize noise. If your child welcomes sound, try playing ambient or classical music when learning. If your child likes bright lights, try removing window treatments, or using full-spectrum bulbs. If your child thrives with lower lights, consider installing dimmer switches or lower wattage bulbs in learning areas. If your child likes to learn in an informal environment, let them study where they are comfortable. If your child prefers a formal environment, keep studying focused at a desk or table. The temperature may also affect your child's ability to concentrate on the subject at hand. Whether they think better in cooler or warmer environments, help make the space conducive to what is most comfortable for learning.

Duff (2014) in his article "Approaches to Learning: The Revised Approaches to Studying Inventory" introduced a learning model which is the Revised Approaches to Studying Inventory model called as RASI. This model defines learning style as "the composite of characteristic, cognitive, affective, and psychological factors that serves as an indicator of how an individual interacts with and respond to the learning environment". He describes students with a preference to deep approach as individuals who look for meaning in what they are learning and enjoy the learning activity. They can make connections to previous learning, use logic, reasoning and evidence well. However, students with a preference for surface approach use primarily memorization to learn. They make fewer connections to the previous learning and have difficulty studying. Meanwhile, students with a preference for a strategic approach want to organize their studying routines, manage their time, and learn what is expected to achieve the highest grade possible.

Hammington (2012) stated that many factors contribute to a student's academic performance, including individual characteristics and family and neighborhood experiences. But research suggests that, among school-related factors, teachers matter most. When it comes to student academic performance, a teacher is estimated to have two to three times the impact of

any other school factor, including services, facilities, and even leadership. Interventions and students attitude to learning was also included.

Hawk and Shah (2017) in their book entitled "Using Learning Style Instruments to Enhance Student Learning" state that learning style instruments inform the choice of learning activities and approaches which enhances the effectiveness and quality of learning for students. The article "Teach to Students' Learning Styles" enumerates the activities fit for students of different learning style. For auditory learners, these activities include interviewing, debating, participating on a panel, giving oral reports, and participating in oral discussions of written material. For visual learners, these activities are suggested: computer graphic, maps, graphs, charts, cartoons, posters, diagrams, text with a lot of pictures. For tactile learners, some favorite activities include drawing, playing board games, and making models. For kinesthetic learners, playing games that involve the whole body, doing movement activities, making models, and setting up experiments. For global learners, choral reading, recorded books, story writing, computer programs, games, group activities. For analytic learners, information presented in sequential steps, teacher directed, clear goals and requirements.

Caluza, et. Al. (2017) Teachers need to be proficient in knowing where and when to use technology for teaching and other related tasks. Teachers' professional development is a key factor to successful integration of computers in classroom teaching (Buabeng-Andoh, C., 2012). It is then recommended that teachers undergo training that will help further enhance their computer skills and knowledge.

In a study master thesis by Wallace (2012) entitled "Learning Styles in the Philippines", he found out that Filipino students could concentrate more when there is bright light. They also prefer a quiet room when studying.

Linnenbrink (2018) in his dissertation entitled, "The Dilemma Of Performance-Approach Goals: The Use Of Multiple Goal Contexts To Promote Students' Motivation And Learning", found out that the particular goal modification method uses the suggested ways of developing mastery goals among students based on six classroom contexts by the acronym TARGET, which as originally created by Epstein (as cited in Linnenbrink, 2015) stands for Tasks, Autonomy, Recognition, Grouping, Evaluation, and Timing. He noted that some goal theorists observed that giving students varied and authentic tasks, allowing them a certain degree of autonomy on learning activities, recognizing their improvement, using heterogeneous small groups, evaluating them based on their improvement, and being flexible in time all help promote mastery goals in the classroom.

On the other hand, in the competitive-goal modification method, the focus is the attainment of learning objectives through games and contests. The use of competition in the classroom enables students to demonstrate their abilities, compare their work with that of others, and outperform their peers. These in turn foster the development of competitive goals among the students. He further notes that the performance-oriented or competitive context is produced when students are "not given varied tasks, the teacher maintains authority, students are recognized for their ability relative to others, homogeneous ability groups and tracking are used, evaluation is based on normative grading practices, and time is inflexible.

There are empirical research indicating inconclusive association between reflective thinking and the academic performance in different disciplines. Phan (2017) on his master thesis showed that understanding (being part of reflective thinking) is related negatively with academic performance for students of educational psychology, whereas, critical thinking (part of reflective thinking) is positively associated with academic performance for students in the mathematics discipline.

Although there is more research regarding the academic effects of positive teacher-student relationships for older students, there are notable social outcomes as well. According to Thornberry (2012), teachers are an important source of social preferences for students. Social capital in a classroom setting is defined as caring teacher-student relationships where students feel that they are both cared for and expected to succeed. Social capital from positive teacher-student relationships can manifest itself in many different ways. For high school students, positive teacher-student relationships can reduce rates of dropping out by nearly half, help explore options for college, and provide support for further academic or vocational aspirations. Common reasons for dropping out include low levels of family support, low academic achievement, poor relationships with peers and adults, and low interest in academics. Positive teacher-student relationships can impact student's social and academic outcomes, and thus reduce drop-out rates.

According to Kobat (2018) teachers found out that in order to design the learning-teaching process appropriate to the individual differences of the learners, the learners would make active participation in the lesson and the individual differences could be supported by increasing the teachers' effective implementation of strategies and techniques.

Xiao (2016) in a Master Thesis entitled "Bridging the Gap Between Teaching Styles and Learning Styles: A Cross-Cultural Perspective" found out that Irish English teachers' styles were contrast to Chinese students expectations. The researcher suggested native English-speaker teachers to use appropriate bridging strategies.

Synthesis of the Study

The related literature and studies are connected to the present study since the learning style of students served as the predictors of academic performance of students.

The studies reviewed strengthen the researcher's discussion of the possible relationship between the two variables.

The cited literature of Tenedero (2018), Yamazaki (2015), Zhang (2015), Brent et al. (2015) Trezise (2017) Fleming (2014) Duff (2014), Hawk and Shah (2017) gave details on different learning styles of students it also defined and supported information how the learning styles of students affects the performance.

While, the studies of Tonog (2013), Wallace (2012) Joaquin (2008) Linnenbrink (2018) Phan (2017) Xiao (2016) found out the results of learning preferences to performance. The learning styles were also discussed and give out reasons by their studies.

METHODOLOGY

This chapter presents the research design, the research locale, the sample and sampling technique, the instruments, the data gathering procedure, and the statistical treatment of the data.

Research Design

This research study used the descriptive-correlation method to determine the learning styles of BSE FILIPINO II students of Eulogio "Amang" Rodriguez Institute of Science and Technology (EARIST).

Calderon and Gonzales (2007) described descriptive research as a purposive process of gathering data, analyzing, classifying, and tabulating data about existing conditions, practices, beliefs processes, trends, and cause-effect relationships. An adequate and accurate interpretation of data can be made with or without statistical treatment.

Samples and Sampling Technique

This study utilized the convenient and purposive sampling technique. Convenient sampling because the respondent were the students of the one who conducted the study. Purposive because it was selected based on the characteristics of the respondents comprises solely taking up education and majoring in physical science.

Research Instruments

The study made use of the validated questionnaire of Razon (2018). Few revisions were made to suit the study. It was composed of two parts: Part I include the academic performance in Filipino for past 3 years; Part II consists of the learning preferred learning styles of learners in terms of environmental preferences, attitude emotion references, sociological references, physiological references and psychological references.

Statistical Treatment

The researcher used the following statistical test to treat the data collected. The data is nominal. Descriptive statistics such frequency, percentage, weighted mean, and pearson and coefficient of correlation.

RESULTS AND DISCUSSIONS

Sub-problem No. 1. What is the performance of the BSE Filipino II students in Filipino for past three years?

Table 1 shows that, learners' performance from the school year 2016-2017 garnered the overall average rating of 84.60 described as moving towards mastery. 2017-2018, For the school year 2017-2018 the performance of learners increased to 85.60 also described as moving towards mastery (MTM). However last year 2018-2019, they achieved an overall performance of 87% described as closely approximating mastery (CAM).

With an overall mean rating of 85.73 from the three consecutive years, it can be deduced that the performance of BSE-Filipino learners in Filipino for the school year of 2016-2019 was generally "Moving towards mastery".

This implies that learners and teachers as well, have a strength and ability to use Filipino language proficiently. The teaching and learning process is very easy for them that resulted to satisfactory level of achievement in Filipino subject. It shows that, Filipino as medium of instruction are easily understood by Filipino learners itself, the activities, situations and application of concept that is being taught is understandable enough to attain most of competencies in this learning area.

Table 1
BSE-Filipino Performance for the Last Three Years

School Year	MPS	Verbal Interpretation
2016-2017	84.60	Moving Towards Mastery
2017-2018	85.60	Moving Towards Mastery
2018-2019	87.00	Closely Approximating Mastery
Overall MPS	85.73	Moving Towards Mastery

Legend

MPS	Descriptive Equivalent
96 – 100%	Mastered
86 – 95%	Closely Approximating Mastery
66 – 85%	Moving Towards Mastery
35 – 65%	Average
15 – 34%	Low
5 – 14%	Very Low
0 - 4%	Absolutely No Mastery

Sub-problem No 2. What learning styles preferences of the learners are exhibits in terms of :

2.1. Environmental preferences;

2.2. Attitude or emotions preferences;

2.3. Sociological preferences;

2.4. Physiological preferences; and

2.5. Psychological preferences?

As shown in the table, Emotion and Attitude Preference (WM=4.24) rank 1; Sociological Preference, Environmental Preference and Physiological Preference (4.23) rank 3; and Psychological Preference rank 5. In general, the learning styles preferences of the learning have an overall mean of 4.23 with verbal interpretation of strongly preferred.

Table 2
Assessment on Learning Styles Preferences

Variables	Weighted Mean	Verbal Interpretation	Rank
Environmental Preference	4.23	SP	3
Emotion and Attitude Preference	4.24	SP	1
Sociological Preference	4.23	SP	3
Physiological Preference	4.23	SP	3
Psychological Preference	4.22	SP	5
Overall Mean	**4.23**	**SP**	

Sub-problem No 3. Is there a significant relationship between learning styles and performance of BSE Filipino II students in Filipino?

Table 3 discloses the test of relationship between learning styles and the level of achievement in Filipino.

Table 3
Relationship Between Learning Styles and Performance in Filipino

Variables	Computed r- value	Critical r- value	Decision	Interpretation
Environmental Preference	0.856	0.248	Reject H_o	Significant
Emotion and Attitude Preference	0.910	0.248	Reject H_o	Significant
Sociological Preference	0.709	0.248	Reject H_o	Significant
Physiological Preference	0.740	0.248	Reject H_o	Significant
Psychological Preference	0.705	0.248	Reject H_o	Significant
Overall	**0.784**	**0.248**	**Reject H_o**	**Significant**

Legend: cv=0.248, df = 61 @0.05 level of significance

The computed r-values of 0.248 which exceeded the critical r-values using 61 degrees of freedom at 5% level of significance reveals that there was significant relationship exist between the learning styles and the level of achievement in Filipino. Hence, the null hypothesis is accepted.

The result implies that learning styles have something to do with the respondents' performance in Filipino probably because the subject is easy for them since it uses Tagalog as the medium of instruction.

Sub-problem 4. What are the problems encountered by the teacher respondents?

Table 4 exposes the problems encountered by respondents in learning styles and academic performance of Grade 8 learners.

Based from the answers of Filipino teachers, the most common problem they faced them today is the delivery of instruction fitted to the interest of learners.

Differences on learning style and preferences achieved (WM= 4.60) rank 1; Learners' emotional and economic background (WM=4.54) rank 2; Crowded classroom setting (WM= 4.52) rank 3; Classroom facilities and design (WM=4.46) rank 4; Learners' interest and motivation to learning & instruction achieved Learners' interest and motivation to learning & instruction (WM=4.36) rank 5; Parental support to learners' learning (WM=4.26) rank 6; Learners' inability to work with groups or peers and Lack of learning resource and materials (WM= 4.14) rank 7.5; Faculty' background on handling individual differences (WM= 4.00) rank 9; Lastly, Absenteeism (WM=3.90) rank 10.

As a whole the overall mean of 4.29 with verbal interpretation of encountered.

Table 4
Problems Encountered by the Respondents

Problems	WM	VI	Rank
1. Learners' interest and motivation to learning & instruction.	4.36	HE	5
2. Learners' inability to work with groups or peers	4.14	E	7.5
3. Differences on learning style and preferences	4.60	HE	1
4. Learners' emotional and economic background	4.54	HE	2
5. Parental support to learners' learning	4.26	HE	6
6. Crowded classroom setting	4.52	HE	3
7. Classroom facilities and design	4.46	HE	4
8. Faculty background on handling individual differences	4.00	E	9
9. Absenteeism	3.90	E	10
10. Lack of learning resource and materials.	4.14	E	7.5
Overall Mean	**4.29**	**E**	

Legend

Scale	Statistical Limits	Verbal Description	
5	4.20 - 5.00	Highly Encountered	(HE)
4	3.40 - 4.19	Encountered	(E)
3	2.60 - 3.39	Moderately Encountered	(ME)
2	1.80 - 2.59	Least Encountered	(LE)
1	1.00 - 1.79	Not Encountered	(NE)

Sub-problem No 5. Based on the result what strategic plan may be recommended?

A strategic plan is proposed which aims to address the difficulties, the problems encountered and to enhance student's performance in Filipino. It is anchored on the competencies of the curriculum guide.

Environmentally, the respondents plan to make positive classroom environment conducive to learning through proper ventilation and lightning, and consider effective classroom management where learners learned most.

It makes sense that learners would do better when they learn in positive environments. Based from educators, faculty can begin making changes that will improve learning environments through lighting and ventilation and effective classroom management. It also shows how much influence the environments have on learners' success.

Emotionally and behaviorally, faculty and experts planned to have interventions aimed at targeting the anxiety in Filipino subject and also to emotional problems of learner. Faculty must support students learning and fear through showing care, love and affection.

Table 5
Proposed Strategies to Improve Teaching-Learning Process

Learning Preferences of Students	Suggested Strategies
Learning Environment Preference	
Sound	The school should always maintain a quiet environment by providing policies that will regulate the entry of noisy vehicles inside the campus especially during class hours. Students discipline should be strengthened by providing regular counseling to noisy students Student lounge or centers available and functions to accommodate students without classes. Schedule of events in the Gym and other assembly areas may not be allowed during class hours.
Light	Well lighted classroom should be maintained by the teachers and school officials all the time. Curtains and other furniture that obstruct light to enter the classrooms and should minimized.
Temperature	Standard number of classes per classroom be maintained. Orientation of the sun be considered in the construction of school buildings. Provisions of adequate electric fans or aircon unit in every classroom be considered
Design and Setting	Provision of comfortable chairs for students in every classroom may be considered. Arrangement of chairs other than rows and columns may be considered to create informal setting
Environmental Preferences	
Motivation	Faculty should recognize students' achievements by using praises and good comments. Feedbacks on the performance of the students should be provided by returning test paper and other assessment tests. Faculty should encourage their students' to learn to make them feel that somebody cares for them.
Persistence	Faculty should provide activities, which are realistic and attainable within a given period of the lesson. Faculty should monitor the progress of students' in doing their learning activities.
Responsibility and structure	The faculty should consider Opportunity for the students to work independently and decide for themselves.
Social Preferences	Variety of learning activities foe individual work, for peer activity and for group activity may be provided for the students'
Physiological Preference	
Perceptual Strength	Activities that will allow students' to get involve in doing things to apply what they learned maybe considered by teacher in preparing activities
Intake	The school may allow students' to chew gum or munch finger foods while in the classroom but be sure to remind them to maintain cleanliness all the time.
Time a Day	Lectures and discussions activities maybe scheduled in the morning while kinesthetic activities be scheduled in the afternoon.
Psychological Preferences	
Analytic	Faculty should provide clear and step by step procedure and instructions to students' in doing their activities
Reflective	Faculty should provide opportunity for students' to develop their higher order thinking skills which maybe develop their reflective thinking

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the findings of the study, the following conclusions are drawn:

1. The BSE Filipino II students have a satisfactory academic performance for the past three years.

2. The respondents manifest environmental preference, emotional preference, sociological preference, physiological preference and psychological preference in learning in a high extent.

3. All elements of learning styles are instrumental with the respondents' performance.

4. Faculty and experts encountered problems with the learning styles of BSE Filipino II students.

5. Faculty and experts developed strategic plan to enhance and improve the performance of BSE-Filipino students.

Recommendations

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

1. Faculty should employ suitable teaching and learning strategies that would address the learning styles of the students.

2. Faculty may develop a thorough understanding of the learning style elements and the learning style of their students' to effectively facilitate learning.

3. Faculty as facilitators of learning should plan and organize instructional activities based on the learning preferences of the students' to improve the rate of quality learning.

4. Faculty should be aware of the individual differences of the learners to determine their strengths and weaknesses, which could in turn help to improve more their performance in Filipino.

5. Administrators should always support the teachers on the exerted efforts by recommending the use of recommend strategies as instructional materials in teaching Filipino.

6. Continuous validation of the learning materials should conduct to determine its usefulness in instructions.

7. Research similar to this study should be undertaken by future researchers to know what other aspects of learning styles may affect learners' performance.

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JOB PERFORMANCE OF BS HOSPITALITY WORKING STUDENTS

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INTRODUCTION

For the past several years, teenagers had been focusing only on studies, and extracurricular activities like having a part-time job were not prioritized at all. This phenomenon is a result of the time ideology that education should be the most important aspect in student's life, however, in our present times of modernization and globalization, the society is coping and learning to embrace the importance of these so-called casual jobs or part-time jobs because of the financial help it could give to the teen students, especially to those who are in the developing countries. aside from the financial aid that part-time job could offer, it serves as the training ground of the young this adults who will enter eventually in their mature life through opportunity, they will experience and learn valuable things like punctuality, professionalism, camaraderie, and other work ethics that will become their guide before their actual job.

Having a part-time job as a student has several advantages in many aspects, and once a good point is that it will help you financially. This part-time job will be a source of funds that can help a student assist him/her regarding education and even in personal needs, and sometimes working students could even provide for someone in his/her household. As have mentioned, it can be seen that there is a lot of positive outcomes a part-time job will bring to students but despite these benefits, a lot of Filipinos value education highly, these part-time jobs are a threat to prioritize education. It depends on how students cope with the situation. Being a working student is a tough situation, it is on the student how to adjust. Some students can overcome the challenges but others suffer from the stress and pressure of school and job. But once accomplished it is something that one can be proud of.

Generally, in our school, working students are having a hard time catching up with the lessons. They are always absent in the class or if they will be able to attend, they would come to class late. Working students have low retention because they lack focus due to fatigue, caused by the nature of their jobs. Students can learn to be responsible and observe punctuality while they study. They have to come to work on time every day and have to be responsible for their duties. In addition to that, students can learn the value of money. Students will realize that it takes a lot of time and effort to make a living, and this experience will enrich them with confidence to face the changes of life. Students will also make the wiser choices when buying things with the money they earned from their sweat.

METHODOLOGY

Descriptive research was used to describe the characteristics of a population or phenomenon being studied. It does not answer questions about how/when/why the characteristics occurred. The methods involved range from the survey which describes the status quo, the correlation study which investigates the relationship between variables, to developmental studies that seek to determine changes over time. Documentary analysis is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning around an assessment topic. Analyzing documents incorporates coding content into themes similar to how focus group or interview transcripts are analyzed. The respondents of the study were composed of (50) respondents composed of BPO, Fast Food Industry, and

Retail Industry BS Hospitality working students of EARIST A.Y. 2019-2020. The respondents assessed and answered the profile of the respondents, and the specific problems respectively.

RESULTS AND DISCUSSION

Sub-problem No.1: How do the respondents assess the Job Performance of BS Hospitality working students of EARIST A.Y 2019-2020?

Table 1
Assessment on the Job Performance of BS Hospitality Working Students

Criteria	BPO		Fast Food Industry		Retail Industry		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
1. Quality. The accuracy, thoroughness, and acceptability of work.	4.00	VS	4.00	VS	3.00	S	3.67	VS	6
2. Quantity. The volume of work produced.	4.35	O	4.35	O	4.09	VS	4.26	O	4
3. Adaptability. The response to changing requirements and conditions.	4.26	O	4.35	O	4.50	O	4.37	O	1
4. Cooperation. The relationship with supervisors and co-workers including the willingness to help others with their overloads.	4.10	VS	4.43	O	4.00	VS	4.18	VS	5
5. Reliability. The extent to which the employee can be relied on to complete responsibility in a timely manner.	4.65	O	4.35	O	4.00	VS	4.33	O	3
6. Attendance and Punctuality. Always come to work on time. Almost complete attendance.	4.00	VS	4.35	O	4.68	O	4.34	O	2
Overall Weighted Mean	**4.23**	**O**	**4.30**	**O**	**4.05**	**VS**	**4.19**	**VS**	

Legend:

Scale	Range			Verbal Interpretation	Symbol
5	4.20	-	5.00	Outstanding	O
4	3.40	-	4.19	Very Satisfactory	VS
3	2.60	-	3.39	Satisfactory	S
2	1.80	-	2.59	Poor	P
1	1.00	-	1.79	Needs Improvement	NI

Table 1 displayed the assessment on the Job Performance of BS Hospitality working students of EARIST A.Y. 2019 – 2020 were rated as Outstanding with an overall weighted mean of 4.38. Four (4) items were rated as Outstanding, these were: Adaptability – the response to changing requirements and conditions with a composite weighted mean of 4.37 as rank 1; Attendance and Punctuality – always come to work on time. Almost complete

attendance with a composite weighted mean of 4.34 as rank 2; Reliability – the extent to which the employee can be relied on to complete responsibility in a timely manner with a composite weighted mean of 4.33 as rank 3; and Quantity – The volume of worked produced with a composite weighted mean of 4.26 as rank 4 Two (2) of the items were rated as Very Satisfactory namely: Cooperation – the relation with supervisor and co-worker including the willingness to help other with their overloads with a composite weighted mean of 4.18 as rank 5; and Quality – the accuracy, thoroughness, and acceptability of work performed with a composite weighted mean of 3.67 as rank 6.

As to the groups of respondents' the assessment on the Job Performance of BS Hospitality working students of EARIST A.Y. 2019 – 20120 were as follows: Fast food industry were rated as Outstanding with an overall weighted mean of 4.30; BPO were rated as Outstanding with a composite weighted mean of 4.23, and Retail Industry were rated as Very Satisfactory with an overall weighted mean of 4.19.

Sub-problem No. 2: Is there a significant difference on the assessment of the three groups of respondents on the Job Performance of BS Hospitality working students of EARIST A.Y. 2019 - 2020?

Table 2
Comparison of assessment on the Job Performance of BS Hospitality Working Students

Respondents	WM	SD
BPO	4.23	1.02
FFI	4.30	0.99
RI	4.05	0.95

Mean of Sum Square	F-value	Critical value	Decision	Interpretation
Between:	0.002469	3.23	Accept Ho	Not Significant
0.01779				
Within:				
7.203817				

Legend: df = 2, 47 @0.05 level of significance

As depicted in Table 2, the computed F-value on the Job Performance of BS Hospitality Working Students as assessed by BPO, Fast Food Industry, and Retail Industry respondents is 0.002469 which is lower than the critical value of 3.23 with the degree of freedom of 47 at 0.05 level of significance. Hence, there is no significant difference on the assessment of the Job Performance of BS Hospitality Working Student. Therefore, the hypothesis is accepted.

Sub-problem No. 3: What are the common problems encountered on the Job Performance of BS Tourism working students of EARIST A.Y. 2017 - 2018?

Table 3
Problems Encountered on the Job Performance of BS Tourism Working Students of EARIST A.Y. 2017 - 2018

Criteria	BPO		Fast Food Industry		Retail Industry		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
1. Do not accomplish tasks/work on time.	2.00	LE	2.30	LE	2.00	LE	2.10	LE	2
2. Uncooperative with co-workers.	1.00	NE	3.39	ME	1.00	NE	1.80	LE	6
3. Cannot produce quality work.	2.00	LE	1.52	NE	2.00	LE	1.84	LE	5
4. Cannot accept change in the organization.	2.00	LE	1.91	LE	2.00	LE	1.97	LE	3
5. Cannot work alone without supervision.	1.00	NE	1.43	NE	1.00	NE	1.14	NE	7
6. Cannot work on time.	2.00	LE	1.74	NE	2.00	LE	1.91	LE	4
7. Always uses excuses for being absent.	2.00	LE	3.13	ME	4.58	HE	3.24	ME	1
Overall Weighted Mean	**1.71**	**NE**	**2.20**	**LE**	**2.08**	**LE**	**2.00**	**LE**	

Legend:

Option	Range			Verbal Interpretation	Symbol
5	4.20	-	5.00	Highly Encountered	HE
4	3.40	-	4.19	Encountered	E
3	2.60	-	3.39	Moderately Encountered	ME
2	1.80	-	2.59	Least Encountered	LE
1	1.00	–	1.79	Not Encountered	NE

As exhibited in Table 3, the problems encountered on the Job Performance of BS Hospitality working students of EARIST A.Y. 2019 – 2020 with an overall composite weighted mean of 2.00 were rated as Least Encountered. One (1) item was rated as Moderately Encountered, this is Always uses excuses on being absent with a composite weighted mean of 3.24 as rank 1. Five (5) items were rated as Least Encountered namely: Do not accomplish task/ work on time with a composite weighted mean of 2.10 as rank 2; Cannot accept change in the organization with a composite weighted mean of 1.97 as rank 3; Cannot work on time with a composite weighted mean of 1.91 as rank 4; Cannot produce quality work with a composite weighted mean of 3.24 as rank 5, and Uncooperative with co-workers with a composite weighted mean of 1.80 as rank 6 One item were rated as Not Encountered this is cannot work alone without supervision with a composite weighted mean of 1.14 as rank 7.

Likewise, the groups of respondents' assessment on the Problems Encountered were as follows: fast food industry were rated as Least Encountered with an overall weighted mean of 2.20; transportation industry were rated as Least Encountered with an overall weighted mean of 2.08, and BPO rated Not Encountered with a composite weighted mean of 1.71.

CONCLUSIONS, AND RECOMMENDATIONS

In light of the above finding, in relation to the major and specific problem address with the study, the following conclusions were derived.

1. The Job Performance of BS Hospitality Working Students of EARIST SY 2019-2020 rated as outstanding by the respondents.

2. The respondents shared a similar assessment on the Job Performance of BS Hospitality Working Students.

3. Only least problem encountered except for the always uses excuses or being absent which is moderately encountered.

From the findings and conclusion, the following are the recommendations of the study:

1. The BS Hospitality working students may continue with their attitude relative to their Job Performance to sustain the outstanding assessment and positive impression from the employers.

2. The management of the industry where the BS Hospitality work on top of their schedule in school may provide assistance to improve the Job Performance of the students by soliciting feedback.

3. The company management may address the issue as to excuses in absences by providing action that will make the working students refrain from absences.

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GENDER DIFFERENCES IN BODY MASS INDEX (BMI) OF FRESHMEN STUDENTS IN EULOGIO "AMANG" RODRIGUEZ INSTITUTE OF SCIENCE AND TECHNOLOGY

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INTRODUCTION

College students have demanding schedules in both their academic and extracurricular activities. According to Pituk (2019) they are more susceptible to adopt unhealthy coping behavior such as Physical inactivity.

For young adults, Body mass index is derived by dividing one's weight in kilograms by their height in meters squared. For college students, the ideal and normal range of BMI is 18.5 – 24.9kg/m^2. If an individual's BMI is less than 18.5 kg/m^2, it falls within the underweight range. When one's BMI is greater than 25 kg/m^2 but less than 30 kg/m^2, it falls within the overweight range. Lastly, if the BMI score of a person is 30.0 kg/m^2 or higher, they are considered as obese. BMI is often used as a screening tool to decide if your weight might be putting you at risk for health problems.

Our body mass index may be an indicator of risk factor for the development of or the prevalence of several health issues. (Nuttall, 2015) According to Marcin (2017), being underweight is associated with certain health risks such as anemia, osteoporosis, decreased immune function, and fertility issues. On the other hand, carrying too much weight can lead to a variety of health conditions, such as type 2 diabetes, high blood pressure, and cardiovascular problem. (Brazier, 2018)

This present study aims to identify the body mass index of the male and female freshmen students of Eulogio "Amang" Rodriguez Institute of Science and Technology, and whether there is a significant difference between the respondents BMI mean score based on sex.

MATERIALS AND METHODS

This quantitative study used convenience sampling for the selection of respondents. The 532 freshmen students in this study consisted of 230 males and 302 females. The selected students were enrolled in Physical Education classes. The gathering of data was implemented by selected Physical Education instructors during their periods. The Physical Education teachers collected the respondent's height using a tape measure and weight using a weighing scale to compute for their BMI.

The researchers utilized Statistical Package for the Social Sciences (SPSS, version 23) for the testing of descriptive statistics and Independent Samples Test. The statistics used also included frequencies, means, and standard deviations. Level of significance was set at .05 levels.

RESULTS AND DISCUSSION

Table 1
Descriptive Statistics on BMI of Students

Parameter	No. of Respondents	Mean	Std. Dev.
BMI	532	21.0489	3.36105

The table above presents the BMI scores of the male and female freshmen students studying in Eulogio "Amang" Rodriguez Institute of Science and Technology. The mean score and standard deviation of the respondents' BMI are 21.0489 and 3.36105 respectively. The data shows clearly that the distribution of BMI score is normal.

Table 2
Frequency and Percent Distribution of the Respondents by BMI Category

BMI Category	Frequency	Percent
Under weight (>18.50)	82	15.4
Normal (Btw. 18.50 & 24.99)	397	74.6
Over weight (Btw. 25 & 29.99)	45	8.5
Obese (=<30)	8	1.5
Total	**532**	**100**

Table 2 shows the categorized BMI test scores of the male and female freshmen students studying in Eulogio "Amang" Rodriguez Institute of Science and Technology. The 532 respondents were grouped into four categories. 82 respondents (15.4%) who has a score of less than 18.5 are underweight. 397 samples (74.6) who got a score between 18.5 and 24.99 were considered as normal. 45 freshmen students (8.5%) who scored more than 24.99 but less than 29.99 are grouped under overweight. 8 participants (1.5%) who has a score above 30 fell under the obese category.

Table 3
Frequency and Percent Distribution of the Male and Female Respondents by BMI Category

Sex	Underweight	%	Normal	%	Overweight	%	Obese	%	
Male	31	13.48	174	75.65	22	9.57	3	1.30	230
Female	51	16.89	223	73.84	23	7.62	5	1.66	302
Total	82		397		45		8		532

The table clearly presents that the majority of the male respondents came from the BMI category of normal with 75.65% and the least coming from the BMI category of obese with 1.3% while male respondents who are classified as underweight and overweight have a percentage of 13.48 and 9.57 respectively.

Based on the BMI scores of the female respondents, most of them have a BMI category of normal with 73.84% and the BMI category of obese has the least number of female respondents with 1.66%. Meanwhile, 16.89% of the female freshmen students are grouped under underweight and 1.66% are categorized under obese.

Table 4
Descriptive Statistics of BMI of the Male and Female Respondents

Parameter	Sex	Frequency	Percent	Mean	Std. Deviation
BMI	Male	230	43.2	21.4213	3.36646
	Female	302	56.8	20.7653	3.33464

The 302 female respondents (56.8%) has a mean score of 20.7653 and 230 male respondents (43.2%) has a mean score of 21.4213. The Standard deviation of the male and female freshmen students who participated in this study are 3.36646 and 3.33464 respectively.

Table 5
Independent Samples T-Test on Gender Perspective of BMI of Respondents

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Score	Equal variances assumed	.318	.573	2.239	530	.026	.65601	.29304	.08034	1.23167
	Equal variances not assumed			2.236	490.669	.026	.65601	.29342	.07849	1.23352

The Independent Samples T-Test was conducted to examine whether the mean of BMI was significantly different between the male and female freshmen students of Eulogio “Amang” Rodriguez Institute of Science and Technology. The table above illustrates that the assessment obtained a p-value of .026 since the p-value is less than .05 the assumed level of significance, this means that there is a significant difference between the mean score of male and female respondents of the current study. The research shows that the mean score of male students was higher than that of female freshmen students of Eulogio “Amang” Rodriguez Institute of Science and Technology.

CONCLUSION

Most of the male and female freshmen students of Eulogio “Amang” Rodriguez Institute of Science and Technology has a BMI score of normal. The researchers found out that there is a significant difference between the BMI scores of the male and female respondents, and that the scores of the female freshmen students are higher than the male freshmen students. Although the BMI scores of the freshmen students are largely normal, it is still quite alarming that 25.4% of the students are considered as underweight, overweight, and obese. These students who fall under these groups should be given special attention. This study may be a basis for the institution to begin a fitness program that will help students of Eulogio “Amang” Rodriguez Institute of Science and Technology to become healthier and physically fit.

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CONVERTIBLE DRAFTING TABLE

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INTRODUCTION

A drafting table is a multipurpose desk used by architects, engineers and artists. It is a stable platform for drawing and reading blueprints. Most tables are height adjustable so a person can stand or sit while working. A key feature found in drafting tables is the ability to adjust the board incline angle to a comfortable drawing position.

A chair is a furniture piece with a raised surface supported by legs, commonly used to seat a single person. Chairs are made of wide variety of materials ranging from wood to metal to synthetic, and may be padded or upholstered in various color and fabrics, either just on the seat or its entirety. Chairs are used in number of rooms in homes, school and offices, and in various workplaces.

A chair and a table are simply what a drafting student needs to do his work aside from other drafting tools and materials such as mechanical pencils, ruler, T-square, etc. The application of the mentioned drafting tools can only be fulfilled with a fine table and a comfortable chair. With these, the researchers conducted a cohesive study in creating a convertible drafting table.

This study aims to support the needs of every drafting student in working on a particular plan. Convertible drafting table is an assemble to disassemble furniture, where it can be converted into a chair or a table depending on the need of the user. For the purpose of this study, the researcher created a convertible drafting table with a height of 70 to 90 centimeters and with a width of 45 to 60 centimeters. This is made up of black iron pipe, galvanized iron pipe and plywood.

METHODOLOGY

The study used descriptive method of research. It is descriptive exploratory since it describes the nature of the situation as it exists at the time of study and to explore the information on the acceptability preference of the development.

The product underwent series of experiments until developed into convertible drafting table for the respondents to evaluate the acceptability preference. Since the product focuses on the acceptability of convertible drafting table will be acceptable to the respondents.

RESULTS AND DISCUSSIONS

Assessment on the acceptability of Convertible Drafting Table

Criteria	Professional Users		Student Users		Composite mean	
	WM	VI	WM	VI	WM	VI
Inventiveness of the product	4.32	A	4.63	HA	4.47	Acceptable
Cost effectiveness	4.31	A	4.58	HA	4.44	Acceptable
Relevance of the product To the existing needs	4.3	A	4.57	HA	4.47	Acceptable
Appropriateness of design	4.4	A	4.59	HA	4.54	Highly Acceptable
Marketability potential	3.3	MA	3.50	A	3.42	Acceptable
General Acceptability	3.8	A	3.60	A	3.70	Acceptable

The table shows the assessment of the respondents both professional and students who are the targeted users of the product. As shown in the result of the composite mean in the inventiveness of the product manifested 4.47, cost effectiveness of the product gained 4.44, 4.47 for relevance of the product all are interpreted as “Acceptable”, 3.42 for the Appropriateness of the product to the desired field interpreted as “Highly Acceptable”, 3.42vfor the market potential interpreted as “ Acceptable”. All the six criteria given in the assessment of the product Convertible Drafting Table got as a satisfying feedback in the targeted users, which indicates that the product meets its objectives.

The following are the summary of what the researchers observed:

1. The supplies and materials needed in making Convertible Drafting Table are the following: Galvanized iron pipe, Black Iron pipe, Formica (white), plywood, spray paint, coat primer, spandex, leather, plastic cover (thick), bolts and nuts and clamp with thread/ bolt.

Tools and equipment used are hack saw, pencil and chalk, measuring tools, needle, sewing thread, welding machine with complete all needed materials, electric drill and Philip screw driver.

2. The procedures undertaken for the creation of Convertible Drafting Table are the following- (a) draw the plan, (b) measure the materials following the plan and leave markings, (c) cut the materials following the markings, (d) build the base structure and weld some of the important parts, (e) make a hole in some materials, (f) paint the metallic base structure using coat primer and let it dry, (g) paint again the metallic materials or the base structure using spray paint for at least two times and let it dry, (h) screw and install metallic materials in their holes, (i) make the table, (j) create the hauler (the chair part and the lean part), (k) create a strap and holder of two black iron pipes (smaller) and (l), install all the materials and finalize it.

3. The Convertible Drafting Table can either be used as a chair or table depending on the need of the user. It is movable from one place to another because of its lightweight feature. It can be assembled and disassembled to maintain the strength and durability if the product is not in use.

CONCLUSIONS

While the researchers are in the process of developing the Convertible Drafting Table, the researchers have come up with the following conclusions:

1. Materials and supplies needed in developing the Convertible Drafting Table are accessible and available in the market.

2. Producing a Convertible Drafting Table entails mid cost with procedures that are easy to follow and execute. Aside from that, lightweight materials are used to create the product.

3. The potential of the Convertible Drafting Table product should be explored since it is convenient and useful for the drafting students and the simplicity of its characteristics.

RECOMMENDATIONS

From the summary and conclusion raised, the researchers have drawn the following recommendations:

1. The product should be registered for intellectual property rights.

2. Product should be aligned based on the generation preference. (color, carrying bag)

3. Rubber footings.

4. Level of the balance

5. Study on marketability of the product should be followed up.

6. The physical attribute of the product as a chair should also be improved to make it more comfortable. In addition, the surface of the table could be upgraded into another type of Formica white material to make it smoother and neater.

7. On parts lessen the removable parts instead fixed it as foldable.

8. Adjustable height of chair and table.

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EMPLOYEES PERFORMANCE WITH BROKEN TIME SCHEDULE IN SELECTED RESTAURANTS IN TRINOMA MALL, QUEZON CITY: AN ASSESSMENT

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INTRODUCTION

In the Philippines, it had been observed that the start of the millennium marked the beginning of a new trend in the work schedule. In a rough and general sense, shift work is an employment practice that involves different work schedules or shifts aside from the usual "standard" day shift (e.g., 8 a.m. – 5 p.m.). It is a mode of scheduling hours of work to ensure continuity in the service or production as a process. In the past, shifting work was more associated with workers in the manufacturing and mining industries. There were also shift workers in establishments such as hotels, restaurants, shopping malls, entertainment businesses, security agencies, transport establishments, hospitals, and health care industries. But nowadays, a shift worker in the Philippines is more likely an employee in a restaurant or a contact center.

There are different types of work schedule which include shift work, compressed work (fitting workweek into fewer days by extending daily hours), overtime, part-time, flexible hours, broken time (allowing workers to fix their daily start and end times outside core hours), annual hours/hours averaging (cumulative work hours calculated over an extended period), staggered hours (starting work at slightly different fixed times), time-autonomous (work time is shaped by tasks), special leave (e.g., parental, educational), and on-call. Any schedule, including a standard workweek, can act as a stressor if it does not conform to the needs of the individual worker. However, the nature of some work schedules means that they have an increased likelihood of causing problems. Working at night or for extended hours, for example, can incur fatigue-related problems that are not associated with some of the other schedules.

A broken schedule is common in industries that have peak periods of work at certain times of a day. Working a broken schedule can be inconvenient because workers don't concentrate their full workday into a single block of time. This is easier than trying to combine part-time jobs into full-time hours and coordinating two or more different employers. In broken times employees needed to work in a substantial course in achieving the aim. The success of work depends on the length of time that one will dedicate to it.

For instance, in restaurants, cooks and waiter staffers often work only during mealtime rush periods, which means, they might work the lunch shift, clock out for a few hours, and then return for the dinner shift. A broken schedule can't even be family-friendly, depending on the schedule.

Nowadays, effective scheduling of employees is time management skills that are required to avoid over-scheduling or under scheduling employees. Employee scheduling is a balancing act but when not done properly, issues can arise such as excessive overtime hours and employee resentment.

The purpose of this study is to determine the perceived factors affecting employees' performance having a broken schedule. What are the problems that the employees are encountering on having this kind of schedule and what are the possible solutions.

METHODOLOGY

This study used the descriptive research method that was designed to gather information. Descriptive research was used to describe the characteristics of a population or phenomenon being studied. This research design enabled the researchers to interpret the theoretical meaning of further information. Descriptive research answered the questions who, what, where, when, and how. It was an effective way to obtain information used in devising hypotheses and proposing associations. Thus, being most suitable for the current study. Population samplings were used and targeted a particular group of people, where the respondents composed of forty (40) Kenny Rogers', thirty (30) Mann Hann, and thirty (30) Sbarro employees in each selected restaurants in Trinoma Mall, Quezon City. The researchers used purposive sampling in the selection of the respondents needed in the study, purposive because the respondents were chosen based on their knowledge and information desired.

RESULTS AND DISCUSSION

Sub Problem No. 1: How do the respondents affect the employees' performance with the broken time schedule in terms of:

1.1 Quality of Work

Table 1
Assessment of Respondents in terms of Quality of Work

Criteria	Kenny Rogers		Mann Hann		Sbarro		Composite	
	WM	VI	WM	VI	WM	VI	WM	VI
1. Inaccuracy	4.20	SA	3.90	A	4.13	A	4.08	A
2. Thoroughness	4.08	A	3.67	A	3.77	A	3.84	A
3. Unproductive	3.95	A	3.60	A	3.97	A	3.84	A
Composite Weighted Mean	**4.08**	**A**	**3.72**	**A**	**3.96**	**A**	**3.92**	**A**

Legend:

Scale	Range			Verbal Interpretation	Symbol
5	4.20	-	5.00	Strongly Agree	SA
4	3.40	-	4.19	Agree	A
3	2.60	-	3.39	Moderately Agree	MA
2	1.80	-	2.59	Disagree	D
1	1.00	-	1.79	Strongly Disagree	SD

As presented from the data in Table 1, the respondents from Kenny Rogers assessed inaccuracy as strongly agree with an obtained weighted mean value of 4.20; the thoroughness and unproductive were assessed as agree with their respective computed weighted mean of 4.08 and 3.95 which yielded a composite weighted mean of 4.08 and interpreted as agree.

The respondents from the Mann Hann rated the three variables presented under the same criteria as agree as evidenced by their respective computed weighted mean value of 3.90, 3.67, and 3.60 which yielded a composite weighted mean value of 3.72.

From the same table, the respondents from Sbarro also rated all the variables under the criteria as agree as supported by their respective computed weighted mean values of 4.10, 3.77, and 3.97 which yielded a composite weighted mean value of 3.96.

As a summary, the three groups of respondents assessed inaccuracy as agree with obtained overall mean value of 4.08; the thoroughness and unproductive were both assessed as agree with obtained overall mean value of 3.84.

Generally, the three groups of respondents assessed the inaccuracy, thoroughness, and unproductive under the quality of work as agree supported by the obtained grand mean of 3.92

1.2 Quantity of Work

Table 2
Assessment of Respondents in Terms of Quantity of Work

Criteria	Kenny Rogers		Mann Hann		Sbarro		Composite	
	WM	VI	WM	VI	WM	VI	WM	VI
1. Can do many task or work.	3.90	A	3.37	MA	3.57	A	3.61	A
2. Can finish the task of work on time.	3.75	A	3.63	A	3.57	A	3.65	A
Composite Weighted Mean	**3.82**	**A**	**3.50**	**A**	**3.57**	**A**	**3.63**	**3.82**

As shown from the data in Table 2, the respondents from Kenny Rogers assessed “can do many task or work” as agree with an obtained weighted mean value of 3.90; “can finish the task of work in time” was assessed as agree with obtained computed weighted mean of 3.75 which yielded a composite weighted mean of 3.82 and was verbally interpreted as agree.

The respondents from the Mann Hann rated item 2 which is “can finish the task of work in time” as agree as evidenced by the obtained weighted mean value of 3.63; item 1 which is “can do many task or work” was assessed as moderately agree as evidenced by the computed weighted mean value of 3.37 which yielded a composite weighted mean value of 3.50 interpreted as agree.

From the same table, the respondents from Sbarro rated the variable presented under the same criteria as agree supported by their respective computed weighted mean values 3.57 which also yielded a computed weighted mean value of 3.57 and interpreted likewise.

To sum up, the three groups of respondents assessed “can finish the task or work in time” as agree with obtained overall mean value of 3.65; they can do many tasks or work as agree with obtained overall mean value of 3.61.

Generally, the three groups of respondents assessed the two variables under the quantity of work as agree supported by the obtained grand mean of 3.63.

1.3 Interpersonal Skills

Table 3
Assessment of Respondents in Terms of Interpersonal Skills

Criteria	Kenny Rogers		Mann Hann		Sbarro		Composite	
	WM	VI	WM	VI	WM	VI	WM	VI
1. Awareness of self and others.	3.70	A	3.60	A	4.37	SA	3.89	A
2. Communication skill with guest	3.72	A	3.53	A	3.67	A	3.64	A
3. Compatibility to work.	2.85	MA	3.70	A	2.93	MA	3.16	MA
Composite Weighted Mean	**3.42**	**A**	**3.61**	**A**	**3.66**	**A**	**3.56**	**A**

As revealed from the data in Table 3, the respondents from Kenny Rogers assessed the three variables presented which are "awareness of self and other" and "communication skill with guest" as agree with their respective computed weighted mean values of 3.70, and 3.72; and "compatibility to work" was assessed as moderately agree with a weighted mean of 2. 85 which yielded a composite weighted mean of 3.42 and were verbally interpreted agree.

The respondents from the Mann Hann rated also all the items presented under the criteria as agree as observed by their respective computed weighted mean values of 3.60, 3.53, and 3.70 yielded a composite weighted mean value of 3.61 verbally interpreted as agree.

The respondents from Sbarro rated item 1 which is "awareness of self and others" as strongly agree supported by the computed weighted mean value 4.37; items 2 which is "communication skills with guest" was assessed as agree supported by the computed weighted mean value of 3.67; item 3 which is "compatibility to work" was assessed as moderately agree supported by the computed weighted mean value of 2.93 which yielded a composite weighted mean value of 3.66 interpreted as agree.

As a summary, the three groups of respondents assessed item 1 generally assessed as agree with an obtained grand mean of 3.89; and item 2 generally assessed as agree with obtained grand mean of 3.64; item 3 generally assessed as moderately agree with obtained grand mean of 3.16.

Generally, the three groups of respondents assessed the three variables under the interpersonal skills as agree supported by the obtained grand mean of 3.56.

Table 4
Summary on the Assessment of Respondents

Criteria	Kenny Rogers		Mann Hann		Sbarro		Composite	
	WM	VI	WM	VI	WM	VI	WM	VI
1. Quality of work	4.08	A	3.72	A	3.96	A	3.92	A
2. Quantity of work	3.82	A	3.50	A	3.57	A	3.63	A
3. Interpersonal skills	3.42	A	3.61	A	3.66	A	3.56	A
Composite Weighted Mean	**3.77**	**A**	**3.61**	**A**	**3.73**	**A**	**3.70**	**A**

As manifested in Table 4, all the respondents rated the criteria as agree. Kenny Rogers employees assessed Quality of Work as agree with a weighted mean of 4.08; Quantity of Work was assessed as agree with a weighted mean of 3.82, and Interpersonal Skills was assessed as agree with 3.42 and obtained a composite weighted mean of 3.77 assessed as agree.

Mann Hann assessed Quality of Work as agree with a weighted mean of 3.72; Quantity of Work was assessed as agree with a weighted mean of 3.50, and Interpersonal Skills was assessed as agree with a weighted mean of 3.61 and obtained a composite weighted mean of 3.61 assessed as agree.

Sbarro on the other hand assessed Quality of Work as agree with a weighted mean of 3.96; Quantity of Work was assessed as agree with a weighted mean of 3.57; and Interpersonal Skills as agree with a weighted mean of 3.66 and obtained a composite weighted mean of 3.73 assessed as agree.

Generally, the three groups of respondents assessed Quality of Work as agree with weighted of 3.92, Quantity of Work as agree with a weighted mean of 3.63, and Interpersonal Skills as agree with a weighted mean of 3.56 supported by the obtained composite weighted mean of 3.70 assessed as agree.

Sub Problem No. 2: Is there any significant difference in the assessment of respondents as to perceived factors affecting employees' broken time schedule in selected restaurants in Trinoma Mall?

Table 5
Significant Difference on the Assessment of Respondents

Sources of Variation	SS	df	MS	F-ratio	Critical value of at .05	VI	Decision
Between Within	0.0425 0.3285	2 6	0.0212 0.0548	0.3869	5.14	Not Significant	Accept H_o

Legend: @0.05 level of significance

It could be noticed from the data in Table 5 that the computed f value of 0.3869 was less than the f critical value of 5.14 with 2, 6 degrees of freedom at a five percent level of significance. The statistical decision was to accept the null hypothesis and verbally interpreted it as not significant.

Since the null hypothesis was accepted, there was strong evidence that there is no significant difference on the assessment of the three groups of respondents on the perceived factors affecting employees broken time schedule in selected restaurants in Trinoma Mall in terms of quality of work, the quantity of work, and interpersonal skill.

In general, experts, faculty, and students shared common perception on the employees' performance with the broken time schedule in selected restaurants in Trinoma Mall in terms of quality of work, a quantity of work, and interpersonal skills.

Sub Problem No. 3: **What are the Problems Encountered by employees with a broken schedule?**

Table 6
Problems Encountered by the Respondents

Criteria	KENNY ROGERS	MANN HANN	SBARRO	TOTAL
	f	f	f	
1. Fatigue	26	19	19	**64**
2. Gastrointestinal Problems (coming from irregular diet and eating habits)	20	16	16	**52**
3. Lazy to go back to work	40	30	29	**99**
4. Sleepiness during waking hours	39	27	27	**93**
5. Increase stress	13	8	11	**32**
6. Lesser time with family instead of having just straight 8 hour job	31	22	15	**68**
7. Not capable of having sideline/double job	29	15	12	**57**

As portrayed in Table 6, as to problem encountered Kenny Rogers, number one problem which is "fatigue" got a frequency of 26; number two problem which is "gastrointestinal problems (coming from irregular diet and eating habits)" got a frequency of 20; number 3 problem which is "lazy to go back to work" got a frequency of 40; number four problem which is "sleepiness during waking hours" got a frequency of 39; number five problem which is "increase stress" got a frequency of 13; number six problem which is "lesser time with family instead of having just straight 8-hour job" got a frequency of 31 and number seven problem which is "not capable of having sideline/double job" got a frequency of 29.

As to Mann Hann, number one problem which is "fatigue" got a frequency of 19; Number two problem which is "gastrointestinal problems (coming from irregular diet and eating habits)" got a frequency of 16; number 3 problem which is "lazy to go back to work" got a frequency of 30; number four problem which is "sleepiness during waking hours" got a frequency of 27; number five problem which is "increase stress" got a frequency of 8; number six problem which is "lesser time with family instead of having just straight 8-hour job" got a frequency of 22 and number seven problem which is "not capable of having sideline/double job" got a frequency of 15.

As to Sbarro, number one problem which is "fatigue" got a frequency of 19; Number two problem which is "gastrointestinal problems (coming from irregular diet and eating habits)" got a frequency of 16; number 3 problem which is "lazy to go back to work" got a frequency of 29; number four problem which is "sleepiness during waking hours" got a frequency of 27; number five problem which is "increase stress" got a frequency of 11; number six problem which is "lesser time with family instead of having just straight 8-hour job" got a frequency of 15 and number seven problem which is "not capable of having sideline/double job" got a frequency of 12.

As a whole, the three groups of respondents as to Kenny Rogers, Mann Hann, and Sbarro, number one problem which is "fatigue" got a frequency of 64; number two problem which is "gastrointestinal problems (coming from irregular diet and eating habits)" got a frequency of 52; number 3 problem which is "lazy to go back to work" got a frequency of 99; number four problem which is "sleepiness during waking hours" got a frequency of 93; number five problem which is "increase stress" got a frequency of 32; number six problem which is

"lesser time with family instead of having just straight 8-hour job" got a frequency of 68 and number seven problem which is "not capable of having sideline/double job" got a frequency of 57.

CONCLUSIONS, AND RECOMMENDATIONS

In light of the above finding, in relation to the address of the major-specific problem with the study, the following conclusions were drawn:

1. The three groups of respondents assessed the factors affecting the Broken Time Schedule in Selected Restaurants in Trinoma Mall in terms of Quality, Quantity of Work, and Interpersonal Skills as agree.

2. There was no significant difference in the assessment of the respondents as to Perceived Factors Affecting Broken Time Schedule in Selected Restaurant in Trinoma Mall.

3. On the other hand, the majority of the respondents ranked number 3 problem which is "Lazy to go back to work" as the problem encountered on the Broken Time Schedule in Selected Restaurant in Trinoma Mall.

Based on the findings and conclusions, the recommendations of the study are as follows:

1. Employees must determine the changes in shifting schedules and how the changes implemented in the workplace before discharge for duties.

2. Employee is hereby recommended to undergo a training program to prepare them for a work shift.

3. The management must provide a work schedule that is worker-friendly to meet operational needs and for their workers to be more productive at work.

4. The management may consider granting an extra incentive to employees to encourage them to work harder.

5. The management may consider providing health insurance to permanent employees.

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THE EFFECTIVENESS ON- THE - JOB TRAINING PROGRAM OF THE ENGINEERING STUDENTS

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Introduction

It is said that education is primarily concerned with the opening out to the world of the students so that he can choose his interest and mode of living, and his career. On the other hand, training is primarily concerned with the preparing the participants from certain line of action, which are delineated by technology and by the organization in which he works. Education is not only limited to the degree an individual can attained however it must be accompanied by character, attitude, behaviors, and values that would significantly affects or influence his performance and productivity.

The most effective method to develop the competence and skills of students is through hands-on training the on-the-job training. This process exposes the students to the different fields and learned. Moreover, it allows the students to become familiar and made known with the actual operation of the business and the state-of-the-art of the facilities, equipment, and technology in used. Many opportunities for development can be found on-the-job. Trainees can learn as they contribute to the goals of the firm. Morale, productivity, and professionalism will normally be high in those individuals that employed a sound OJT program.

As per required by the CHED, graduating students of different majors undergo on-the-job training with required time of three hundred hours. Perhaps this would be the steppingstone for the practicums to develop themselves to become professionals in their own fields of specialization and acquire new learning through gained experiences during trainings. It is very essentials components of learning process, geared toward preparing students future career. However, practicum along the way encountered uncertainties and problems that would one way or another will affect their on-the-job performances. Some would feel disappointed and dissatisfied to the on the job training they received. Many factors are to be considered that the on-the-job training was properly managed.

There is a need to review the way the training function is implemented and put in place effective strategies that work. They should ensure that all guidelines are effectively followed and training that is urgently needed provided. In addition to that, there is still a need to change the methods of training that are not effective and provide more methods of practical nature. Since there has neither been a comprehensive policy to guide an appropriate implementation of training program nor should adequate efforts to make them aware of its function the HR department strives to design an effective policy and involve all respective employees in its implementation. This will help to reduce the growing negative attitude towards the function. It is important for the organization to ensure that employees are adequately trained as planned and that there is a reasonable return on investment that is put into training. Particular attention must be paid to the characteristics of ideal training program during the design and implementation stage. The first two years of the program provide a balanced academic foundation for acquiring the basic knowledge and skills for the course including computer fundamentals. It also develops skills in critical thinking, problem solving, and decision making which is an important preparation for responsible and effective practice of the profession. The last three years are concerned with professional development in the understanding of the different elements of their major subjects. To implement an effective faculty development program to keep abreast in the

fast-changing technology. To utilize faculty expertise for relevant community -oriented projects and activities.

STATEMENT OF THE PROBLEM

This study focuses on the assessment of the Effectiveness of the On-The-Job-Training program of the engineering students. Several questions were applied. Specifically, it aims to answer the following questions:

1. How do the students assess the OJT program as to?
   - 1.1 Vocational and trade skills
   - 1.2 Work qualities and habits
   - 1.3 Personalities and social qualities
   - 1.4 Communication skills
   - 1.5 Public and human relation
2. What are the problems encountered by the students?
3. What recommendation could be proposed to improve the OJT program?

MATERIALS AND METHOD

The researchers utilized a descriptive method of research in conducting the study. This method is intended to find existing facts that shall serve as an information process in the study. This study is designed to assess the effectiveness on – the - job training of the selected engineering students. The data from a descriptive survey when used as basis for inference may aid in solving practical problem. The come up of this research, the researcher used descriptive method to gathered data from the respondents using survey questionnaires and interview to those respondents who are available that time. Descriptive design focuses on the present condition and the purpose is to find the truth. **THE RESPONDENTS** is a selected engineering student who will assess the on-the -job training program. The formulas will use to answer the research questions.

1. Weighted Arithmetic Mean – it is the simplest and most efficient measure of central tendency.

Formula $X = \frac{\Sigma}{N}$

Where

X – is the symbol for weighted mean

Σ – is the summation or the sum

N – the samples

Results and Discussion

1. How do the students assess the OJT as to?

Table 1

	Weighted Mean	Verbal Interpretation	Rank
Vocational and trade skills	3.74	Highly Effective	2.5
Works qualities and habits	3.46	Effective	4
Personalities and Social qualities	3.74	Highly Effective	2.5
Communication skills	3.26	Effective	5
Public and Human relation	4.17	Highly Effective	1
Average Weighted Mean	**3.67**	**Highly Effective**	

Table 1 shows the weighted mean and verbal interpretation of the students in terms of how do they assess the OJT program of college of engineering? As gleaned from the table it revealed that the vocational and trade skills is 3.74 – highly effective, Work qualities and habits 3.46 – effective, Personalities and Social qualities 3.74 – Highly effective, Communication skills 3.26 – effective, and Public and human relation is 4.17 – highly effective.

2. What are the problems encountered by the students?

Table 2

Risk of accident in the place	Frequency	Percentage
Always	0	0.00%
Sometimes	30	85.71%
Rare	3	8.60%
Never	2	5.71%

Table 2 shows the frequency and percentage that the respondents encountered in OJT in risk of accident in the place. Always 0%, sometimes 30 or 85.71%, rare 3 or 8.6% and never 2 or 5.71%.

Table 3

Inadequate Knowledge Regarding the Task Assigned	Frequency	Percentage
Always	21	60.00%
Sometimes	10	28.57%
Rare	4	11.43%
Never	0	0.00%

Table 3 shows the frequency and percentage that the respondents encountered in OJT in Inadequate knowledge regarding the task assigned. Always 21 or 60%, sometimes 10 or 28.57%, rare 4 or 11.43% and never 0 %.

Table 4

No Allowance, Benefits, and Incentives Provides by the Firm	Frequency	Percentage
Always	12	34.29%
Sometimes	14	40.00%
Rare	4	11.43%
Never	5	14.29%

Table 4 shows the frequency and percentage that the respondents encountered in OJT in No allowance, benefits and incentives provide by the firm. Always 12 or 34.29%, sometimes 14 or 40%, rare 4 or 11.43% and never 5 or 14.29 %.

Table 5

Facilities & Equipment Used In the firm are modernized	Frequency	Percentage
Always	19	54.29%
Sometimes	8	22.89%
Rare	5	14.29%
Never	3	8.60%

Table 5 shows the frequency and percentage that the respondents encountered in OJT in Facilities & equipment used in the firm are modernized. Always 19 or 54.29%, sometimes 8 or 22.89%, rare 5 or 14.29% and never 3 or 8.6 %.

3. What recommendation could be proposed to improve the OJT program?

- The goals of the training program should relate directly to the needs. Course objectives should clearly state what skill will be changed because of the training and should relate to the mission and strategic plan of the school. Goals should include milestones to help take the faculty and students from where he or she is today to where the firm wants him or her in the future. Setting goals helps to evaluate the training program and to motivate faculty and students. Allowing the respondents to participate in setting goals increases the probability of success.

- Training should be evaluated several times during the process. Respondents should be evaluated by comparing their newly acquired skills with the skills defined by the goals of the training program. Any discrepancies should be noted, and adjustments made to the training program to enable it to meet specified goals. Many training programs fall short of their expectations simply because the administrator failed to evaluate its progress until it was too late. Timely evaluation will prevent the training from straying from its goals.

CONCLUSIONS

The researcher arrived the following conclusions:

1. In terms of assessment of the students of OJT programs, in vocational and trade skills. Majority of the respondent's care of materials and supplies 4.17 highly effective. In work qualities and habits, Ability to follow direction 3.74 – highly effective. Personal and social qualities, Cooperativeness-ability to work together with people 3.86 – highly effective. Communication skills, Ability in oral communication w 4.00– highly effective. Public and human relation, Ability to work harmoniously with immediate superiors/s 3.89 – highly effective.

2. In what problems encountered by the students. risk of accident in most of the respondents sometimes 30 or 85.71%. In Inadequate knowledge regarding the task assigned. Always 21 or 60%. In Distance of cooperating firm from home. Always 16 or 45%. In No allowance, benefits and incentives provides by the firm, sometimes 14 or 40%. Lastly, in Facilities & equipment used in the firm are modernized. Always 19 or 54.29%.

3. In what recommendation could be proposed to improve the OJT program, the researcher proposed that the goals of the training program should relate directly to the needs. Course objectives should clearly state what skill will be changed because of the training and should relate to the mission and strategic plan of the school.

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EFFECTS OF LUZON LOCKDOWN CAUSE BY PANDEMICS COVID-19 IN BICYCLE STORES AND REPAIR SHOP IN METRO MANILA: AN ASSESSMENT

Joel D. Reyes
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INTRODUCTION

The Effects of Lockdown Cause By Pandemics COVID-19 In Bicycle Stores and Repair Shop in Metro Manila make a bad effects and good opportunity to the bicycles store and repair shop specially in Metro Manila after Luzon lockdown was pronounce by the Government of the Philippines.

On March 24, 2020 all non-essentials business like bicycle's store and repair shop is force to close by the IATF and the only allowed are medicinal stores and groceries, all forms of mass transportation were stopped due to the enhanced community quarantine in Luzon brought by COVID-19 pandemic, that cause the frontlines workers to get hard to go to their places of work.

Manila Biker Jerome Martines and his fellow cycling enthusiasts came up with the idea to help front liners to go to work.

This led to the Lend-A-Bike project which aims to provide bicycles as an alternative mode of transportation for front liners, especially health workers.

Many of our health workers and front liners have to walk long hours just to get to their work or to go back home," said Martines, who has been biking for 18 years now.

Martines, initiative started last March 17, the second day of the full implementation of the Luzon-wide enhanced community quarantine.

The initial plan was just to have this within my friends in the cycling community. However, after 2 days only, I got hundreds of requests to provide bikes for our health workers and front liners," narrated Martines, who owns a bike shop in Metro Manila.

Martines, admitted he is not able to track the total number of transactions made because of the many requests. But he said more than 100 bikes were lent to frontliners since the start of the quarantine.

He didn't expect this initiative to grow this fast and this big. But at the same time, I'm challenged to seek partnerships and employ a better system of lending and borrowing so that we can provide more bikes to those in need at these difficult times of our country," said Martines.

Before the Pandemic Robert Y. Siy, a development economist, city and regional planner, and public transport advocate on Last February 9, 2019, urban planners and transport specialists were pleased to hear Department of Public Works and Highways (DPWH) Secretary Mark Villar declare that his department would be including sidewalks and bike lanes in all new road infrastructure projects. This was welcome news from an agency that historically had taken a very "car-oriented" approach to building roads and bridges.

To improve the mobility of urban Filipinos, it will be important for key agencies like DPWH and the Department of Transportation (DOTr) to embrace the objective of "moving people, not cars". This means defining goals in terms of the people numbers rather than vehicle numbers, and measuring performance in terms of the experience of people rather than the travel speed of cars.

If we adopt a people-centered yardstick to measure the productivity of our roads, it is clear that prioritizing cars on urban roads is neither sound nor sustainable. To solve our mobility problems, there has to be much more travel by public transport, walking and cycling. Using roads for bicycles makes a lot of sense — one lane of road devoted to cars can move only about 1,500 persons per hour, compared to 7,500 persons per hour if the same road space were used for a two-way protected bike lane.

Secretaries Arthur Tugade and Mark Villar, the country needs you to be "champions" for cycling. Philippine bicycle organizations will love to work with DOTr and DPWH to craft a national cycling development program. There are active, well-organized cycling clubs all over the country with hundreds of thousands of members ready to participate in a "Bike, Bike, Bike" program. And there is no better time to hold a "Cycling Summit" to hear what the cycling community has to say.

A joint DPWH-DOTr and DILG administrative order could provide specific instructions for inclusion of walking and cycling infrastructure in national and local development plans and projects. It would give full meaning to the National Economic Development Authority (Neda) board-approved national transport policy and its implementing rules and regulations which state that:

"Inclusive mobility and accessibility shall be achieved through the prioritization of people-mobility over vehicle-mobility….provision for non-motorized or active transport, such as walking and cycling, shall be incorporated in the design and implementation of transport projects….Active transport should be promoted, through the development of greenways, car-free zones, public open spaces, sidewalks, bike lanes, and bicycle sharing services."

Cycling is not only low-cost and zero-emission; it also delivers significant health benefits to the cyclist. Bicycles are affordable for all income groups, unlike automobiles which are used only by the wealthiest 10 percent of Filipinos. And for persons with certain types of physical disabilities (such as foot joint dysfunctions), cycling provides a better option than walking.

Many of the cities great for cycling—Copenhagen, Amsterdam, Sevilla, Bogota—were not always that way. Fifty years ago, these cities were very much like Manila dominated by cars and increasingly congested. But city officials soon realized that just filling roads with more cars was not sustainable. Cities began to invest in non-car transport infrastructure–shifting road space to sidewalks, bike lanes and exclusive lanes for buses. What are some of the lessons from their efforts at promoting bicycle use?

First, it is important to develop a network of safe, well-signed bicycle lanes connecting major origin and destination points. Bike lanes are ineffective if they are not linked to a network. Bike lanes need to be well-marked, evenly paved and separated from cars and motorcycles. In a metropolis like Metro Manila covering 17 local government units (LGUs), the Metro Manila Development Authority (MMDA) should lead in designing the network, so that even major roads—such as EDSA, C-5, Ortigas Ave. and Shaw Blvd.—can be safe for bikes.

Second, leadership and political will are important factors for success—and mayors have key roles to play. What can city mayors do? Promote active mobility—walking, cycling and public transport instead of car or motorcycle use. Hire a bicycle program director for your city. Create

public spaces where adults and kids can learn to ride bicycles. Launch car-free days to raise awareness of the benefits of walking and cycling. Encourage schools to teach students how to bike and adopt safe biking practices.

Develop a cycling plan for your LGU and allocate budget resources to create a safe network of bike lanes. Consult with community organizations and bicycle groups to build support and to identify the best routes for the bike lane network. Work with DPWH and DOTr to link bike routes to public transport services.

Develop or require bicycle parking wherever possible, particularly at schools, markets, hospitals, terminals, places of employment and other major destinations in your city. Offer loans or financial incentives for your constituents to own and use bicycles. Ride a bicycle to work and encourage city hall employees to do the same! It will get you media attention and votes.

SYNTHESIS

1. The Uncontrolled Bicycle Price

Regulating a Price tag of Bicycle is a big Problem according to (DTI) Department of Trade and Industry because of the thousand brand, model and combination of assembled bicycles, like combination of different parts from China, Taiwan, Malaysia, Indonesia, Poland, USA, Italy, Japan and local Philippine made products, Wheel sets models, brand and style is unlimited according to the bicycle stores defend on customer perspective and styles, Group-sets parts (*known as bicycle mechanical machines is a combination of different group-sets)* like the most popular brand and hierarchy of Japan made Shimano, Champaniolo of Italy, SRAM of Germany, LTWOO of China, Magura of Europe and other different suppliers from Asia and United States and Europe.

2. The Bicycle Critics "Discourages Cycling"

There are *critics* who say that bicycles will never take off in the Philippines as a form of daily transport because the climate is too hot and humid in the summer and too wet in the rainy season. But cycling thrives even under difficult conditions.

There are *officials who discourage cycling* because they consider it as an inherently dangerous form of transportation. Cyclists who are killed by car crashes are often the ones blamed, even though unsafe street design and bad car driving behavior are the main causes of cyclist fatalities.

Cyclists may sometimes seem invisible in Philippine cities, but their numbers are growing. You may not see them because bikes are generally moving much faster than cars during rush hour. Bicycles have been so "invisible", it seems government has not counted them as a transport mode in previous travel demand surveys. The JICA-funded 2014 study of daily travel patterns in Greater Manila somehow failed to measure the number of individuals who travel by bicycle, a serious oversight.

3. The bicycles commuters in the Philippines

More Filipinos are switching to biking for their daily commute. Just ask building owners and real estate developers. Ayala, SM and Megaworld will tell you that bike racks in their developments are in short supply—in central business districts, every single bike parking space available is being used.

Cycling technology is also changing rapidly, making them more functional and convenient. Electric-assist models enable cyclists to reduce their pedaling effort even on hilly terrain. And bicycle sharing/rental platforms, using mobile phones to activate the bikes, eliminate the need for investing in one's own bicycle.

New York, London and Madrid are as hot and humid as Manila in the summer, yet cycling in those cities remains popular regardless of the season of the year. Our neighboring ASEAN cities–Bangkok, Singapore and Jakarta (with climates just like ours)–are making big investments in cycling infrastructure. We should not be left behind.

Today, Amsterdam has a 500 kilometers (kms) cycling network. Bogota, another global leader in cycling, has 410 kms of protected cycle paths. Metro Manila can achieve the same. Imagine if each of the 17 local government units within Metro Manila committed to creating 25 kms of protected bike lanes over the next three years.

We would achieve a network of 425 kms of bike lanes within Metro Manila by the end of 2021, at a total cost of less than P2 billion. It would change dramatically the character of our metropolis and make it more livable, healthy and productive. Chairman Danny Lim, this could be one of your transformative legacies!

If cycling can be made safer and more convenient, it can make public transport more appealing. A train station with good walking access can probably attract people within a one-kilometer radius from the station; but a train station that has good bicycle parking and is well-connected to a network of bike lanes can have a catchment area with a radius of 5 kilometers or more.

More cyclist will benefit all Philippine cities, big and small. Low cost, pro-poor, quick-to-implement, environment-friendly, and health-promoting! If city mayors and national officials are looking for projects that can be delivered within the next three years, cycling infrastructure should be high on the list. Secretaries Villar and Tugade, the "Bike, Bike, Bike" program needs your leadership and support.

METHODOLOGY

Research Design

This study employed the descriptive method of research using online/offline questionnaire in gathering respondents data on the **EFFECTS OF LUZON LOCKDOWN CAUSE BY PANDEMICS COVID-19 IN BICYCLE STORES AND REPAIR SHOP IN METRO MANILA: AN ASSESMENT.**

According to Jackson (2009) descriptive method research is used to obtain information concerning the current status of the phenomena to describe "what exist" with respect to the variables or conditions in a situation. The method involved range from the survey to describe the status and to developmental studies which seek to determine changes over time. This method is highly emphasized that can only be describe as a set of observation on the data collected.

Population and Sampling

The research study limited to the business owners, staffs and clients online/offline. The selection of the respondents done through purposive sampling. According to O'Sullivan, Rassel, and Berner (2008), the main criterion for selecting any unit from the population using

this sampling procedure is the researcher's judgment that the unit somehow represents the population. Often units for this type of sample are selected on the basis of known characteristics that seem to represent the population. The researcher assumes that the units selected represent the population on unknown characteristics as well.

Table 1
Population of the Study

Group	Total	
	F	%
Business Owner	21	20
Staff	21	20
Clients	61	60
Total	**103**	**100**

Table 2
Respondents as to Age

Age	Business Owner		Staff		Clients		Total	
	F	%	F	%	f	%	f	%
51 years old and above	2	10	2	10	15	25	19	18
41-50 years old	5	24	6	29	13	21	24	23
21-40 years old	14	67	13	62	33	54	60	59
Total	**21**	**100**	**21**	**100**	**61**	**100**	**103**	**100**

Table 3
Respondents as to Gender

Criteria	Business Owner		Staff		Clients		Total	
	F	%	F	%	f	%	F	%
Male	13	62	13	62	29	48	55	53
Female	8	28	8	38	32	63	48	47
Total	**21**	**100**	**21**	**100**	**61**	**100**	**103**	**100**

Table 4
Respondents as to Civil Status

Criteria	Business Owner		Staff		Clients		Total	
	F	%	F	%	f	%	f	%
Single	12	57	13	62	29	48	54	52
Married	9	43	8	38	26	43	43	42
Separated/ Annulled					4	7	4	4
Widow/er					2	3	2	2
Total	**21**	**100**	**21**	**100**	**61**	**100**	**103**	**100**

Table 5
Respondents as to Educational Attainment

Criteria	Business Owner		Staff		Clients		Total	
	F	%	F	%	f	%	f	%
Doctorate's Degree	1	5	1	5	3	5	5	5
Master's Degree	3	14	2	10	5	8	10	10
Bachelor Degree	12	57	13	62	18	31	43	42
Vocational Graduate	4	19	3	14	10	16	17	16
High School	1	5	2	10	25	43	28	27
Total	**21**	**100**	**21**	**100**	**61**	**100**	**103**	**100**

Table 6
Respondents as to Profession

Criteria	Business Owner		Staff		Clients		Total	
	F	%	f	%	f	%	f	%
Government Employee					20	33	20	19
Businessman/ woman	15	71	6	29	30	49	51	50
Retired Government Employee	6	29	15	71	11	18	32	31
Total	**21**	**100**	**21**	**100**	**61**	**100**	**103**	**100**

PRESENTATION, ANALYSIS AND INTERPRETATION

What are the products Offered by different Bicycle Stores in Metro Manila?

Table 7
Products Offered by different Bicycle Stores in Metro Manila

Areas of Concern	Business Owner		Staff		Clients		Total		Rank
	F	%	f	%	f	%	f	%	
1. XC Bike	4	19	2	10	2	3	8	8	4
2. Road Bike	2	10	5	24	3	5	10	10	3
3. BMX	1	5	3	14	6	10	10	10	3
4. Hybrid	5	24	1	5	9	15	15	15	1
5. Hard tail	1	5			4	7	5	5	6
6. Ladies Bike	3	14			2	3	5	5	6
7. Cycle Cross					2	3	2	2	9
8. Gravel Bike					8	13	8	8	4
9. Enduro MTB	1	5	3	14	9	15	13	13	2
10. E-Bike	1	5	1	5	4	7	6	6	5
11. Triathlon Bike					1	2	1	1	10
12. Foldable Bike	1	5			4	7	5	5	6
13. TT Bike Supplier					3	5	3	3	8
14. Downhill Bike					1	2	1	1	10
15. Recreational Bike			4	19			4	4	7
16. Dirt Jumper Bike	1	5			2	3	3	3	8
17. Japan Surplus Bike	1	5	2	10	1	2	4	4	7
Total	**21**	**100**	**21**	**100**	**61**	**100**	**103**	**100**	

OVERVIEW, SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Overview

This chapter is here to give the summary of the findings from the field. Generally, the findings during Covid 19-crisis indicate that more than 90% of the trends in business are always changing and one of the leading businesses are bicycle industry; however, if observed carefully, those businesses that thrive for a long time are those that offer products and services that cater the basic necessities of the people like *products* related to basic transportation to avoid mass transportation during pandemic and to evade the spreading of the virus. The business ideas listed may be trendy, but it doesn't guarantee that once you start with it, you will be successful immediately. Careful planning, researching, identifying the target market and complying of the legal requirements when starting a business are still important factors to consider.

More and more bicycle entrepreneurs are starting to dominate in the business world producing eco-friendly products as more people are switching and supporting those products. Driven by the passion and mission to save the environment, more organic and sustainable products are being produced and well-received by clients. Among the popular organic products are different types, brand and styles of bicycles made from steel, aluminum, titanium, carbon and bamboos, and many more. Consumers are now more aware of how other products in the market affect the Earth, so they are now more than willing to purchase green brands to support and promote sustainability. Such business venture has also created job opportunities to the locals because of the business owners hire the former to produce the products.

Summary

The salient findings of the study are as follows:

1. The products Offered by different Bicycle Stores in Metro Manila

The assessment of the respondents on the Products and Services of Bicycle Business Establishments are as follow: 15 or 15 percent are XC Bike, 13 or 13 percent are Road Bike, 10 or 10 percent are BMX and Hybrid and Hard tail, 8 or 8 percent are Ladies Bike and Cycle Cross and Gravel Bike, 6 or 6 percent are Enduro Bike, E-Bike and Triathlon Bike, 5 or 5 percent are Foldable, TT Bike, and Downhill, Cross Country and Recreational, 4 or 4 percent are Dirt Jumper, and Japan Surplus, 3 or 3 percent are Generic parts from china, Taiwan and branded parts from Japan, and European, 2 or 2 percent are Malaysia, and 1 or 1 percent is Local made from the Philippines.

Conclusion

The Researched Study found the important of bicycle business and industry to support the growing popularity of bicycles as a form of transportation around the 16 Cities of Manila, Quezon City, Caloocan, Las Piñas, Makati, Malabon, Mandaluyong, Marikina, Muntinlupa, Navotas, Parañaque, Pasay, Pasig, San Juan, Taguig, and Valenzuela, as well as the Municipality of Pateros in Metro Manila after the government recognize the important of bicycle as the COVID 19 Pandemic safest medium of transportation in the transformation from old Way to New Normal.

But the Technological Innovations and laws in Bicycles Transportation are badly needed to help facilitating this growth like bikes lane and bicycle parking to include in urban planning.

Researchers, has highlighted the important role of bicycles in the coming years in easing traffic congestion and improving urban air quality and public health, especially in 16 cities of Manila as they become more heavily populated.
Overall, Researchers are predicting that the number of people who bike to work will double in many major cities around the Metro Manila and increase the possibility of business opportunity in bicycle industry by 2022.

Recommendation

Base on the data from the field the following are the recommendation.

The effects of so many more bicycles on the road, and consequently less vehicles and improve social distancing, could be substantial and bring about societal changes like less vehicular traffic, which would greatly improve congestion, air quality and contamination of air born virus like covid-19. More people biking and less pollution is also good news for public health, too.

This becomes even more crucial when you consider future population growth, especially in cities whose transportation systems are already being pushed to their limits. Researcher also believes that this dramatic growth in biking to work is being largely spurred by technological innovations across the bicycle industry, which increasingly makes bicycling to work easier and more attractive to many customers.

Underlying this growth in bike-riding is an array of diverse technological innovations, including different brand of bicycles, type, styles, design.

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