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EMAIL: asianintellectorg@gmail.com WEBSITE: www.asianintellect.org

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1. All articles must be authorized for publication by the author/s.

2. All the research papers published must have a high degree of scholarship.

3 All the research papers published must be approved by the editorial board .

4. All the research papers published must have undergone evaluation from our corps of referees thru double-blind referee process.

5. The articles may either be written in English or Filipino. All articles written in either languages must be accom panied by an Abstract which is written in English.

6. All contributions must be original.

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SOLAR-POWERED FLOOD MONITORING AND SECURITY SYSTEM THROUGH SHORT MESSAGING SERVICE

Engr. Angeluzel M. Tonido, MSEE
Engineering Instructor, University of Rizal System
PhDTE Student, Rizal Technological University

ABSTRACT

Flood arises from medium rainfall to very high thunderstorms similarly in Laguna Lake, in range with natural changes, technology and the idea of integrating it into technical ways of addressing calamity has become a major adverse. Technology integration has proven to be beneficial for all and leaves nothing but positive results. Most of the time people are experiencing erroneous flooding especially at water basin areas like the Laguna Lake due to continuous rainfall and rigid water drainage. Subsequently, alongside the lakeshore of the Laguna Lake many residences experiences sudden flooding even in a minimum rainfall. The purpose of this study was to develop a "Solar-Powered Flood Monitoring and Security System through Short Messaging Service". The system device enables end-users, the residents of the flood prone Laguna Lakeshore area to receive a text message every time there is a change of water level sensed by an ultrasonic sensor with respect to the situated water gauge. Since the device operates as solar-powered, the whole operation of the system device is supported even under power breakout and is stand-alone. It was found to address security and monitoring in Laguna Lake more efficiently, thus it addresses the security to persons with hearing disability through its Light System Notification and persons with sight disability by the Alarm System Notification. Professionals and other researchers who wished to conduct this kind of study was recommend to study and address all the problems encountered by the researcher.

Keywords: Solar-Powered Flood Monitoring and Security System through Short Messaging Service, nanotechnology, ultrasonic sensor, water gauge, short messaging service, SDLC Agile Scrum, renewable energy .

INTRODUCTION

Nowadays and even early in times before, natural disaster is one major adverse event resulting from natural processes of the earth; examples include floods, hurricanes, tornadoes, volcanic eruptions, earthquakes, tsunamis, and other geologic processes. A natural disaster can cause loss of life or property damage, and typically leaves some economic damage in its wake, the severity of which depends on the rouse of affected population or ability to recover and on the infrastructure available.

Since the country is located and bounded at the Pacific Ocean, the country experienced more than 25 typhoons per year and because of these, the security of people and their belongings occur as the necessity. Most of the time people are experiencing erroneous flooding especially at water basin areas like the Laguna Lake due to continuous rainfall and rigid water drainage. Subsequently, alongside the lakeshore of the Laguna Lake many residences experiences sudden flooding even in a minimum rainfall.

With particular motives, the researcher comes up with developing a "Solar-Powered Flood Monitoring and Security System through Short Messaging Service". The device will act as security and monitoring device that will usually visualize water level as well as send an alarm signal to the people through a short messaging service (SMS) or man server's phone whenever the water exceeded its maximum water limit or reached the given standard staff gauge.

To this extent the residences or community living alongside Laguna Lake will be notified on the water level and if needed they could evacuate ahead of time which will result for less casualties or even assent with zero casualty. In addition, it is design to be stand-alone and the system device would contribute to the advocacy of utilizing renewable energy for these will operate with a solar powered panel.

STATEMENT OF THE PROBLEM

The purpose of the study was to develop the Solar-Powered Flood Monitoring and Security System through Short Messaging Service.

Specifically, the study answered the following research questions:

1. What are the stages undertaken in the development of the Solar-Powered Flood Monitoring and Security System through Short Messaging Service?
2. How do the end-users and other stakeholders evaluate the system in terms of:
   - 2.1 functionality,
   - 2.2 construction,
   - 2.3 realizability,
   - 2.4 impact, and
   - 2.5 presentation?
3. What is the difference between the perceptions of the end-users and other stakeholders on the use of the system device?
4. What problems are encountered by the respondents in the use of the monitoring system as perceived by the end-users and stakeholders?
5. What solutions can be proposed to address the encountered problems?

STATEMENT OF THE HYPOTHESIS

The study tested the hypothesis that there is a significant difference between the perceptions of the end-users and other stakeholders on the use of the system device.

METHODOLOGY

This research was guided through descriptive and developmental method that provides an extensive and deeper understanding of the basis in profound study of the research in determining the construction of the Solar-Powered Flood Monitoring and Security System through Short Messaging Service.

The design of the phases undertaken in the development of the Solar-Powered Flood Monitoring and Security System through Short Messaging Service was present through the Agile Scrum model for the system development and waterfall model for the development of the system device hardware.

The researcher used the pre, post evaluation survey assessment to prove the representativeness of the respondents, and researcher-modified questionnaire checklist for the acceptability of the developed device as instruments of the study to gather and analyze data. The proponent conducted an interview with some subject concerned citizens and private and government stakeholders.

The subject of the study were took from two sets of respondents through random sampling method. They were thirty (30) citizens residing at the area of the study, Tanay dike and the other set of respondents is the thirty (30) private and government stakeholders, and both will determine the acceptability of the development of Solar-Powered Flood Monitoring and Security System through Short Messaging Service. The citizens residing at the area of the study also served as the subjects of the study since they would be the persons who will benefit first from the system device. The respondents were gather through the Stratified Random Sampling technique.

The system device was evaluated of the end-user respondents with the use of the researcher-made questionnaire checklist. To assess the acceptability of the hypothesis t-test was used. On the other hand, for the apprehensions for the acceptability of the device in terms of functionality, construction, realizability, impact, and presentation for developed output, based from the perception of the stakeholders and end-users of the study, the researcher used the weighted mean statistical treatment.

REVIEW OF LITERATURE

The review of literature discusses the working principles and running theories behind solar energy, solar heating principles, ultrasonic sensing, temperature as well as Project NOAH and the “Flood Alert Level Guide & Online Resources for Monitoring Marikina River & Floods” and other related researches of the study.

The year 2017 was a landmark one for solar photovoltaics (PV): the world added more capacity from solar PV than from any other type of power generating technology. More solar PV was installed than the net capacity additions of fossil fuels and nuclear power combined. In 2017, solar PV was the top source of new power capacity in several major markets, including China, India, Japan and the United States. (Renewable Energy Policy Network in the 21st Century REN21, 2018)

On the other part, in terms of communication the short messaging service (SMS) is taking the

lead since 2009. Short Message Service (SMS) gateway is a mechanism by which SMS messages are sent and receive. SMS gateways facilitate and streamline text messaging processes for organizations, and will often do some of the conversion to different formats. It was found that almost nine of or ten users shared that they usually have their phone 24/7. (www.techopedia.com, 2017)

The sun produces a tremendous amount of energy. Every second, the sun will continue producing solar energy for another 5 billion years! As a result, solar energy was considered the ultimate renewable energy. Solar energy is a renewable source. A renewable source is a resource that was able to be replaced or replenished, either by the earth's natural processes or by human action. Solar energy is available at varying proportions almost everywhere on earth. It cannot be depleted unlike the fossil fuel based energy resources. Solar energy is a "clean" energy resource. It does not involve the emission of Green House Gases (GHGs) that are believed to be responsible for the worsening global warming of our planet Earth. (http://mechanical.uonbi.ac.ke/sites/default/files/cae/solar.pdf)

The use of MCU to control devices will ensure transfer or deliver more precise and efficient. Microcontrollers are frequently used in automatically controlled products and devices, such as automobile engine control systems, remote controls, office machines, appliances, power tolls and toys. By reducing the size, cost and power consumption compared to a design using a separate microprocessors, memory and input/output devices, microcontrollers make it economical to electronically control many more processes. An MCU could process discrete and in some models even analogue and mixed signals. It could do mathematical computations. MCU controlled devices are very efficient because it follows the program instruction fast and accurate. It could count and time input and output. (Sevilla, 2014).

Several countries including the UK, Austria and the Netherlands, have announced plans to improve solar powered devices within 10 or 15 years. France's prime minister announced last week that the country would shut all its coal plants by 2023.

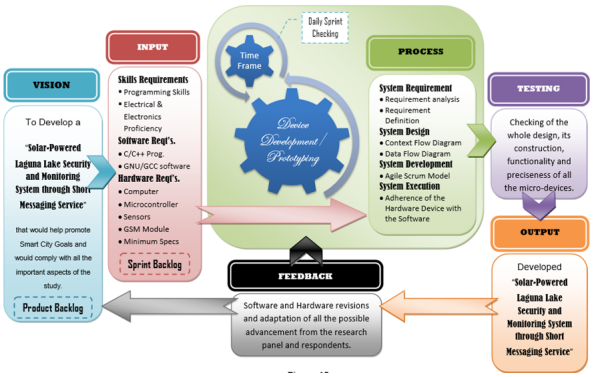
The review of literature in summation addresses better ways to innovate the way things are. Regardless of the favorable circumstances, it would still be essential if this research system device became one of the first advancement to bring in a modernized and smart city goals in dealing with Laguna Lake security and monitoring. That puts it ahead of other ways on compromising with the advancement of the Philippines as "texting capital" to utilize SMS technology, abundant solar energy to apply solar panel and innovative designing of circuitry with the microcontrollers.

FINDINGS

The summary of the design result stated as follows were established based on the experimentation conducted by the proponent and the evaluation made by the respondents.

Results of the study are summarized as follows:

1. Stages Involved in the Development of the Solar-Powered Flood Monitoring and Security System through Short Messaging Service



An SDLC Agile Scrum Model Showing the Stages Undertaken in the Design and Development of the "Solar-Powered Flood Monitoring and Security System through Short Messaging Service"

The study used the Agile Scrum and Waterfall Model in the development of the Solar-Powered Flood Monitoring and Security System through Short Messaging Service. The Agile Scrum Model consisted of the product backlog/vision phase, sprint backlog/input phase, sprint phase along with process phase, testing phase, output phase and feedback phase. The Waterfall Model plotted down all the necessary elements of the process for the development of the System Device. It started from possible requirements to design, implementing, testing and maintenance.

2. Evaluation of Experts and Stakeholders on the Product by Selected Criteria.

2.1 On the level of acceptability in terms of Functionality, the system device garnered an average weighted mean of 4.53 for the end-users and 4.63 as perceived by the stakeholders; both values are verbally interpreted as "Highly Acceptable".

2.2 On the level of acceptability in terms of Construction, the system device garnered an average weighted mean of 4.68 for the end-users and 4.70 as perceived by the stakeholders; both values are verbally interpreted as "Highly Acceptable".

Composite Table on the Acceptability of Solar-Powered Flood Monitoring and Security System through Short Messaging Service

Variables	Average Mean		Verbal Interpretation
	End-Users	Stakeholders	
1. Functionality	4.63	4.53	Highly Acceptable
2. Construction	4.68	4.70	Highly Acceptable
3. Realizability	4.60	4.60	Highly Acceptable
4. Impact	4.83	4.85	Highly Acceptable
5. Presentation	4.80	4.75	Highly Acceptable
Over-all Weighted Mean	4.71	4.69	Highly Acceptable

2.3 In terms of the level of acceptability in terms of Realizability, the system device garnered an average weighted mean of 4.60 for the end-users and same with 4.60 as perceived by the stakeholders; both values are verbally interpreted as "Highly Acceptable".

2.4 While on the level of acceptability in terms of Impact, the system device garnered an average weighted mean of 4.85 for the end-users and 4.83 as perceived by the stakeholders; both values are verbally interpreted as "Highly Acceptable".

2.5 Lastly, on the level of acceptability in terms of Presentation, the system device garnered an average weighted mean of 4.80 for the end-users and 4.75 as perceived by the stakeholders; both values are verbally interpreted as "Highly Acceptable".

2.6 In general the acceptability of the Solar-Powered Flood Monitoring and Security System through Short Messaging Service gathered 4.71 as assessed by end-users and 4.69 as perceived by the stakeholders; both are verbally interpreted as "Highly Acceptable".

It was found that Impact got the highest mean from both respondents because of the technological contribution to the advancement of natural disaster monitoring and security. On the other hand, functionality even verbally interpreted as "Highly Acceptable" as perceived by the stakeholders it was found to have the least man value. With the use of respondents evaluation and comments it was stated that functionality got least since the system device is a miniature prototype and it could have gotten much higher mean if it is functioning in real ratio.

3. Difference between the Perceptions of the End-users and Other Stakeholders on the Use of the System Device

The p-value is 0.063 and, therefore, the difference between the two means are not significantly different from zero at the 5% level of significance. There is an estimated change of 6.4% (SE = 3.17%). However, there is insufficient evidence (p=0.063) to suggest that there is a significant difference found in the perceptions of the end-users and other stakeholders on the use of the system device.

Independent Sample Test for Solar-Powered Flood Monitoring and Security System through Short Messaging Service Perception of Respondents

	Quality of Variance		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Equal variance assumed	.197	.663	1.995	16	.063	6.33	3.175	-.397	13.064
Equal variance not assumed			1.995	14.624	.065	6.33	3.175	-.449	13.116

Significant difference was found in the perceptions of the end-users and other stakeholders on the use of the system device as presented above.

4. Problems Encountered by the End-users and Other Stakeholders.

Problems encountered includes insufficient amount of energy collected from the sun (18 out of 60 respondents), the device only provides limited number slots for mobile phones (12 out of 60 respondents), ultrasonic sensors have short range (4 out of 60 respondents), life span of batteries (24 out of 60 respondents) and phone signal on location site (16 out of 60 respondents). Hence, the problems encountered by the respondents were also presented to the next table below. The project objectives were successfully achieved.

5. Proposed solutions to address the encountered problems

The researcher through the help of experts have plotted the problems encountered in the utilization of the device and all the possible solutions to each aspect was discussed on the next page

Problem	Probable Cause	*Solution to the Problem*	Remarks
Insufficient amount of energy collected to run the system device.	Unavailability of Solar energy at night or some other cases.	Aside from being solar-powered as alternative at least provide a plugged source that when solar is not present the battery can gather energy from it.	Implemented
The device only provides limited number slots for mobile phone.	Low specification of the GSM module and sim card.	As for recommendation by the experts it would be best to store all phone numbers in a SD card for it allocates more adjustable phone number memory space.	Recommended
Ultrasonic sensors have short range.	Locally made and available, hence higher range needs higher financial budget	Check the location where to put the system device if it can be covered by locally available then there is no need to get a much higher ultrasonic sensor range.	Studied and implemented the use of locally available
Life span of batteries	Each battery has its own span; the low cost and specification of the battery the shorter its life span.	Make sure that the user/ maintenance is aware of the specifications of the battery so as he also know when to check or swap batteries to deal with long working span.	Studied and some safety measures applied
Phone signal on their location.	Weak transmission on their location	From the study and data gathered sought for the best network that will cater them with good signal.	Studied, Tested and recommended

Solutions to Problems Encountered by the Respondents in the Use of Solar-Powered Flood Monitoring and Security System through Short Messaging Service

CONCLUSION

Based on the summary of findings it was found that the use of SDLC Agile Scrum and Waterfall models helps facilitate the successful development of the Solar-Powered Flood Monitoring and Security System through Short Messaging Service. The Solar-Powered Flood Monitoring and Security System through Short Messaging Service is Highly Acceptable to both the end-users and other stakeholders. Both the end-users and other stakeholders profess similar perceptions on the acceptability of the system device. The Solar-Powered Flood Monitoring and Security System through Short Messaging Service addresses more effectively and efficiently the flood monitoring and security system in Laguna Lake. Specifically the device addresses security to persons with hearing disability through the Light system Notification and sight disability by means of Alarm system Notification. Problems encountered were completely address through the help of experts and was properly handled with the help of the developed user's manual. Lastly, in general term the Solar-Powered Flood Monitoring and Security System through Short Messaging Service was successfully developed.

RECOMMENDATIONS

Gathered from the findings and conclusions of this study as well as from the respondents, the following are recommended: Aside from the SDLC Agile Scrum and waterfall model, it is suggested to explore other effective methodology for the actual implementation of the system device. Though the system device gathered a highly acceptable interpretation on all the variables, the least was found under the functionality at some reason it is because these study provided a prototype. Likewise, if this research prototype is to be actualized it is recommended to seek stakeholders on the proper specifications, materials cost and values of hardware elements to attain 100% efficiency on the functionality of the device. On selection of respondents it is highly advised to conduct compatibility test with the study to address each group of respondents' individual satisfaction index, this is to come up with an effective result on their perception. With respect to some problems encountered discussed on chapter IV, in the manifestation of putting up an actual system device at the study area, stakeholders advised to buy at least one designated number for the system device whereas instead of receiving a water level notification from a #09061485611 sample type of number, end users will see an operator assigned number which is more than conceivable. Moreover, it is much better to designate a name; instead of an operators number the system device send SMS would reflect send by: "Laguna Lake Update" which will quote for the system device update. Further studies should be taken to improve and address higher efficiency to other Laguna Lake residences. And lastly for the next researcher of this type of study, it is advised to go through experimental research to deal with more specific values to broadly discuss the efficiency of the system device.

ACKNOWLEDGMENT

Immeasurable appreciation and deepest gratitude to all experts and professional who willingly help the researcher throughout the period. To the Local Government Units and Private institutions active participation during the conduct unto the success of the study.

To the loving memory of the researchers' hero, Sir Dad Angel. To the ever supportive and loving family of the researcher Mom Luz, Nay Memay, Luzet, Lezer, Loyd, Jha, Angelo, Xian, Mickel and Pie Kim Russel.

And most of all to God Almighty!

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A SELF-ORGANIZING BEHAVIOR IN HOSPITALITY INDUSTRY IN THE PHILIPPINES

Clare Maristela V. Galon[1] and Leigh Anne A. Mijares[2]
[1]Department of Chemistry and Physics, College of Arts and Sciences, Cebu Normal University
[2]Department of Tourism Management, College of Arts and Sciences, Cebu Normal University
Osmena Blvd., Cebu City, Cebu, Philippines

ABSTRACT

Hospitality industry is a viable business that requires ability, knowledge and skills to adapt constantly to customers' changing needs and desires. As players in the tourism industry interact, certain types of social behavior emerge and tourists play an important role. In this paper, Complex Adaptive Systems (CAS) is used for this study to simulate how interaction happens among local and international tourists who during traveling are: 1) Willing to stay in the place and pay all the packages; 2) Stick to the package only; 3) Willing to stay in the place and pay the cheapest; and 4) Joiner. This can give us comparative analysis of the development of island resorts in the Philippines that could affect the boosting of hospitality industries. We found out that the most frequently occurring interaction is those tourists who are willing to stay in the place, but stick to the package only while the least is those tourists who are willing to stay in the place and pay all the packages. In general, the overall tourists' population are sensible in spending their money when visiting a destination and their final decisions can be affected after series of interactions from different other tourists' decisions. Therefore, the tourism industry must adapt to such changes to further compete in the global market place and establish great destinations for everyone.

Keywords: Complex Adaptive Systems, Social Atoms, Hospitality Industry, Philippines, Simulation

INTRODUCTION

Hospitality industry is a dynamic and competitive business that requires ability, knowledge and skills to adapt constantly to customers' changing needs and desires. The Philippines is composed of many islands, thus it is a great way to understand social dynamics incorporating social physics to market its natural and man-made resources. This fact will guide the management to better provide services and satisfy guests. The hospitality can be defined as the reception and entertainment of guests or strangers with empathy, kindness, and an overall concern for their well-being. It is at the heart of all tourism and without providing a friendly and welcoming environment for visitors, tourism cannot develop successfully.

The goal of this research is to simulate the social interactions of tourists, i.e. international and local. Specifically, we will look into how the tourists behave depending on the effects of the external parameters like promotion, place, price, and product. We will also study the individual contributions of each tourist who possesses unique choice and decision when traveling and how this individual can change the whole system upon interacting with other individual who also possesses unique choice and decision when traveling. Complex Adaptive Systems (CAS) is useful for this study to help us understand how aggregate agents, i.e. local and international guests, could affect the boosting of hospitality industry, specifically in island resorts. This can give us comparative analysis of the development of island resorts in the Philippines, and thus gives us insights of its future trends that could be beneficial to the Department of Tourism and policy makers in the Philippines. This will also give us a picture of how guests behave depending on marketing mix, i.e. price, product, place, and promotion. Lastly, this will provide us better comprehension of the competitive ability of the adaptive agents, i.e. Philippine island resorts, to withstand in the market value around the world.

Tourists are blood life of the industry, without them the industry cannot survive in the competitive world of business. For this reason, we need to fully understand the behavior of each tourist. However, the tourism in the Philippines cannot

sometimes forecast the endeavors in the industry specifically the behavior of the tourist, both local and international, coming in to the country. Tourists with high level of satisfaction may recommend a certain destination to friends, visit again and leave positive feedback about the experience. However, dissatisfied tourists, apart from being displeased with the choice and not recommending it to others, may also criticize it (Seyidov, 2017).

Through CAS development, the researchers could help develop the tourism and hospitality industry in the 21st century by: a.) Using methods of social physics in understanding agents' satisfaction and to know future trends of hospitality industry through social physics; b.) Creating sustainable development plan to better preserve the natural resources of the island resorts in the Philippines; c.) Acting locally, but thinking globally and sustaining its market value to the competitive world of hospitality industry; d) Satisfying agents' needs and wants and providing them quality services; e) Providing data to Department of Tourism (DOT) and policy makers of the Philippines regarding the past, present, and future development of island resorts; and f.) Putting into reality the DOT's slogan of the Philippines, "It's More Fun in the Philippines," without comprising the resources.

CONCEPTUAL FRAMEWORK

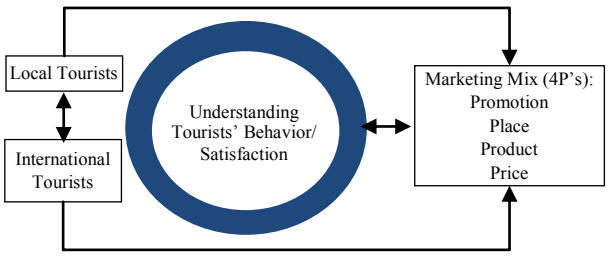

Figure 1. Conceptual Framework on Understanding Tourists' Behavior

Figure 1 shows the conceptual framework of local and international tourists, who are coming and traveling into the Philippines, interact with each other, and how purchasing tourism products could affect their overall behaviors and satisfaction. Both of them interrelate to the marketing mix (4Ps) which are the promotion, place, product and price of the tourism industry. By this, the researchers will be able to understand tourists' behavior towards tourism and hospitality industry as a whole.

The final decisions and behavior of each tourist may be affected upon interplay among other tourists after their frequent socializations. A tourist, who is unique with certain characteristics, can contribute to the changes of the other tourist's behavior that also possesses unique characteristics. Thus, tourists play an important role to the whole outcomes in apprehending how tourism industries market their product, place, and packages that come with it which could give great satisfaction to the stakeholders, i.e. local and international tourists.

METHODOLOGY

The researchers used the Complex Adaptive System with the aid of Minitab 17, which is a free downloadable statistical software, for this study to simulate how aggregate agents (i.e. local and international guests) could affect the boosting of hospitality industry, specifically in island resorts. This will give us a picture of how guests behave depending on marketing mix (price, product, place, and promotion). This will also provide us better comprehension of the competitive ability of the adaptive agents (i.e. Philippine island resorts) to withstand in the market value around the world. For the social atoms, i.e. local and international tourists, we set n = 250 for international tourists and n = 250 for local tourists. Each tourist was set to have four (4) unique characteristics: a) willing to stay and pay all; b) stick to the package; c) willing to stay and pay the cheapest; d) joiner (can't pay).

Aggregate Agent/s

We will look into the local tourists and international tourists coming and availing any tourism products offered in any island resorts in the Philippines.

Social Atom

For the simulation of the interaction of the social atoms, we let:

local tourists
International tourists
and Marketing Mix (Factors that will affect the behavior):
(P1) Product
(P2) Place
(P3) Promotion
(P4) Price

Action of Social Atoms

In understanding the overall behavior and satisfaction of the tourists, we have established probabilistic values that are common behaviors of tourists when visiting island resorts. We let:

Probability:

0.1: W- Willing to stay and pay all (1)
0.3: S- Stick to the package (no additional services and activities) (3)
0.4: C- Willing to stay and pay the cheapest (4)
0.2: J- Joiner (can't pay) (2)

where 0.1 is the least probable and 0.4 is the most probable

Social Atom's Interaction

The social interactions of the local tourist (A) and international tourists (B) having different characteristics (W, S, C, J) were simulated based on the set probabilistic values and marketing mix. The social interaction is tabulated in Table 1. It shows how after a local tourist and an international tourist with distinct characteristics affects each other and contributed to their final behavior and decision with regards to choosing a certain hospitality industry. In Table 2, the learning adaptation of the interaction of a unique local tourist and another unique local tourist is shown as well as the learning adaptation of the interaction of a unique international tourist and another unique international tourist.

Table 1. Social Interaction of local tourists and international tourists

ATOM	ACTION	INTERAC-TION	PROBA-BILITY	LEARNING/ ADAPTATION
LOCAL TOURIST (A)	**W**: Willing to stay and pay all **S**: Stick to the package **C**: Willing to stay and pay the cheapest **J**: Joiner	AW – BW	[0.1, 0.1]	AW, BW
		AW – BS	[0.1, 0.3]	AW
		AW – BC	[0.1, 0.4]	AS
		AW – BJ	[0.1, 0.2]	AC
		AS – BW	[0.3, 0.1]	AJ
		AS – BS	[0.3, 0.3]	AS, BS
		AS – BC	[0.3, 0.4]	AC
		AS – BJ	[0.3, 0.2]	AS
		AC – BW	[0.4, 0.1]	AS
INTER-NATIONAL TOURIST (B)		AC – BS	[0.4, 0.3]	BC
		AC – BJ	[0.4, 0.2]	BJ
		AC – BC	[0.4, 0.4]	AC, BC
		AJ – BW	[0.2, 0.1]	BW
		AJ – BJ	[0.2, 0.2]	AJ, BJ
		AJ – BC	[0.2, 0.4]	BC
		AJ – BS	[0.2, 0.3]	BC

Table 2. Social Interaction of among local tourists and among international tourists

ATOM	ACTION	INTERAC-TION	PROBA-BILITY	LEARNING/ ADAPTATION
LOCAL TOURIST (A)	W: Willing to stay and pay all S: Stick to the package C: Willing to stay and pay the cheapest J: Joiner	AW – AW	[0.1, 0.1]	AW
		AW – AS	[0.1, 0.3]	AW
		AW – AC	[0.1, 0.4]	AS
		AW – AJ	[0.1, 0.2]	AC
		AS – AS	[0.3, 0.3]	AS
		AS – AC	[0.3, 0.4]	AS
		AS – AJ	[0.3, 0.2]	AC
		AC – AC	[0.4, 0.4]	AC
		AC – AJ	[0.4, 0.2]	AC
		AJ – AJ	[0.2, 0.2]	AJ
INTER-NATION-AL TOUR-IST (B)		BW – BW	[0.1, 0.1]	BW
		BW – BS	[0.1, 0.3]	BW
		BW – BC	[0.1, 0.4]	BS
		BW – BJ	[0.1, 0.2]	BS
		BS – BS	[0.3, 0.3]	BJ
		BS – BC	[0.3, 0.4]	BS
		BS – BJ	[0.3, 0.2]	BS
		BC – BC	[0.4, 0.4]	BC
		BC – BJ	[0.4, 0.2]	BC
		BJ – BJ	[0.2, 0.2]	BJ

RESULTS & DISCUSSIONS

The simulated results of the interactions of the social atoms are shown in Figures 2-4. The local tourists (n= 250) with four characteristics are set to interact among themselves as well as among the international tourists (n = 250) with the same characteristics only. The histograms of the social interactions of local tourists (see Figure 2) and international tourists (see Figure 3) form a Gaussian distribution with mean values equal to 2.8 and 2.7. The most frequently occurring interaction is those tourists who are willing to stay, but stick to the package only while the least is those tourists who are willing to stay and pay all. The social atoms of the same kind after interacting among themselves are set to network to the different kind of social atoms. The social interactions among local and international tourists are now governed among the three characteristics of tourists: those who stick to the package; those who can pay the cheapest; and those who are just joiners. In the last social interaction that has been set (see Figure 4), the mean is centered between the tourists who stick to the package only and who can pay the cheapest. The histogram shows a mean value of 3.4. The least initial probability is affected by the other probabilities during the series of social interactions.

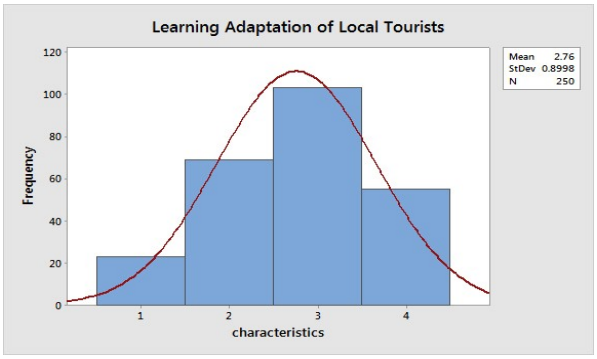

Figure 2. Histogram of the social interaction among local tourists. X -axis is the four characteristics : (1) Willing to stay and pay all; (2) Joiner; (3) Stick to the package; (4) Willing to stay and pay the

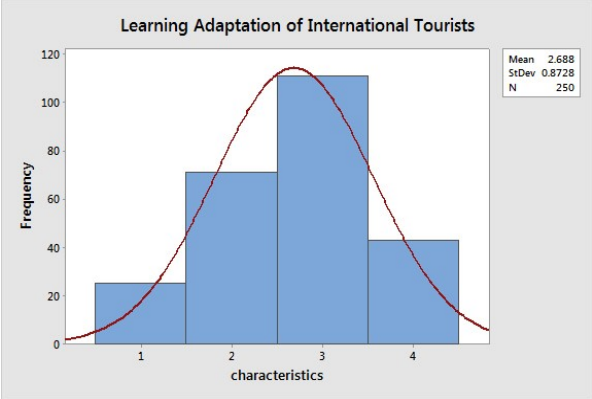

Figure 3. Histogram of the social interaction among international tourists. X-axis is the four characteristics : (1) Willing to stay and pay all; (2) Joiner; (3) Stick to the package; (4) Willing to stay and pay the cheapest.

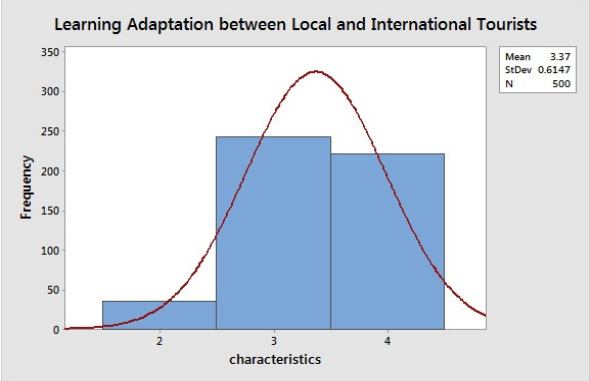

Figure 4. Histogram of the social interaction of local and international tourists after interacting among their own type. X-axis is the four characteristics : (2) Joiner; (3) Stick to the package; (4) Willing to stay and pay the cheapest.

Cited by Badilla (2015), there are classifications of tourists and one of it is the "Organized mass tourists", which is the type of tourist who buys all-inclusive tour packages and ensures that everything goes as planned. This statement is in accordance to the study that most of the tourists prefer packages. With this, to have higher income in an organization, they used "Market penetration pricing". This means that it is used when setting a low initial selling price to penetrate the market quickly and to attract many buyers for a large market share. With this, the market will be more striking and they will easily purchase the product.

Morrison (2010) said that customers buy things that they perceive as matching their images of themselves. This implies that because of economic squalor, people now are more practical in purchasing hospitality and tourism services.

Kotler (2006) said that a study of tourists who purchase all-inclusive travel packages versus those who make travel arrangements independently revealed that lifestyle characteristics varied. All inclusive-travel purchases are more socially interactive, solicitous, and take their travel motivations mainly to relax. Tourists who prefer independent travel arrangements are more self-confident and often sought solitude [7].

CONCLUSIONS

Marketing facilities enable the exchange process and the development of relationships by carefully examining the needs and wants of the customers, developing a product or service that satisfies these needs, offering it at a certain price, making it available through a particular place or channel or distribution, and developing a program of promotion to create awareness and interest. Marketing Mix or 4P's are so important to know for it is the core functions of marketing. Badilla (2015) stated the product is what the company is offering to satisfy a consumer's want or need. Price is the value that the seller put on the product/ service. Place is the means by which the product/ service reaches the consumer. Promotion is the strategic plan by which customers are informed about and its value. In the same vein, this statement implies that in order to study the self-organizing behavior of the tourists, we need to associate it with the tourists' arrival in the country, i.e. local and international tourists.

The most frequently occurring interaction is those tourists who are willing to stay, but stick to the package only. Most local and international tourists now are hesitant to spend their money in some unnecessary product. They wanted to stay in an island resort but in a more practical manner and would only stick to how much their original budget is. They are judicious enough to spend their money and get some package tour because they think that they can save more time, effort and

money in visiting the destination. On the other hand, the least is those tourists who are willing to stay and pay all. This means that few tourists are willing to extravagantly spend their money in purchasing tourism products. They don't care how much it will cost them as long as they are enjoying their visit and tour.

In general, the overall tourists' population, both local and international, are sensible in spending their money when visiting a destination. Likewise, they do an advance study before going to certain tourism spots which means that they have already sufficient knowledge about the destination they will be visiting. With these results presented, the hospitality and tourism management organization (i.e. public or private sectors) should be aware of the new trends in the industry. They must create packages specifically for an island resort that are fair to all types of market in order for Philippines to be more competitive and that tourists will consider first our country to visit. According to UNESCO (2000), collaboration of different government agencies, private and public sector that take the initiative in promoting tourism endeavors should require the expertise of many individuals. Once a site or community has decided to pursue tourism development, it should begin to organize in building a local consensus that supports tourism. This step should include gaining support from local businesses, uniting local government and seeking the cooperation of service organizations.

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ORGANIC AQUACULTURE IN NEGROS OCCIDENTAL, THE PHILIPPINES: STATUS AND CONSTRAINTS

Erwin L. Pador
Senior Aquaculturist
Bureau of Fisheries and Aquatic Resources, Regional Office VI
MuelleLoney St., Iloilo City

Frank Paolo Jay B. Albarico
Faculty, Fisheries and Marine Sciences Department
Northern Negros State College of Science and Technology
Old Sagay, Sagay City

ABSTRACT

The development of organic aquaculture in the Philippines has been very slow despite the approval of Republic Act 10068. To gather insights, a province-wide field survey and one-on-one interviews throughout Negros Occidental in 2015 with organic aquaculture practitioners were done to determine the practices, farmers' awareness on principles and standards, and problems encountered in organic aquaculture operations. There were 64 farmers who practised organic aquaculture according to initial data, however, 19 were found compliant to the minimum standards. All of the identified compliant practitioners were aware of the basic concepts but only those who have attended organic farming courses, seminars, or trainings were aware of the standard. Major problems and concerns that slow down the development of organic aquaculture are: longer culture periods, lack of local organic market posts, contamination, lack of continuous fingerlings supply, lack of awareness on the principles and standards, minimal support from the local government, and high standards and certification costs. Negros Occidental has to struggle in converting conventional aquaculture farms to organic. Thus, long-term sustainability of existing practitioners should be promoted to keep them from going back to conventional practices. Increased efforts and initiatives are needed to promote and sustain organic aquaculture in Negros Occidental.

Keywords: Organic aquaculture, organic aquaculture awareness, Philippine National Standard, minimum standards, organic certification, Negros Occidental.

INTRODUCTION

Organic agriculture in the Philippines has been growing the past few years with some certified farms. However organic aquaculture is still on its initial stages. In the Philippines, Western Visayas leads in terms of organic agriculture production areas with 11,592 ha (Cayon 2014). In 2009, the Organic Certification Center of the Philippines (OCCP) has certified 22 farms all over the country (OCCP 2009); this is still increasing up to the present. As of 2016, the Bureau of Agriculture and Fisheries Standards (BAFS 2016a) reported a total of 46 third party-certified organic farms and establishments in the country. In contrast, none of these farms are used for organic aquaculture.

A strong campaign in organic aquaculture was started when Republic Act 10068 "Organic Agriculture Act of 2010" was passed (RA 10068 2010); followed by the creation of the "Philippine National Standard" (PNS) for Organic Aquaculture in 2012 (BAFS 2012; BAFS 2016b). Republic Act 10068 aims to promote, propagate, develop further and implement the practice of organic agriculture in the country (RA 10068 2010). Likewise, this also aims to enrich soil fertility and productivity, reduce pollution and destruction of the environment, and protect the health of farmers, consumers and the general public from harmful effects of inorganic matters. Various authors reviewed the negative impacts of inorganic aquaculture practices (Cabello 2006; Primavera 2006; Sarà 2007: Sapkota et al. 2008; Kümmerer, 2009). To cite a few conclusions, antibiotic residues can

cause aplastic anemia and leukemia (Rich et al. 1950; Yunis 1989; Malkin et al. 1990; Issaragrisil et al. 2005), and bone marrow suppression (Ambekar 2000). Biodiversity is also threatened (McLaughlin and Mineau 1995; Robinson and Sutherland 2002; Bengtsson et al. 2005; Tuck et al. 2014).

Being new in the Philippines, organic aquaculture focuses on the development of suitable culture species and production technologies. Production practices vary widely according to the biology of the cultured organism, culture techniques used, fertilizers and feeds, water management, local conditions, ownership structure, culture period, harvest techniques, and market demand. Some management techniques and practices, such as drainage significantly alter the species composition that creates fundamental habitat changes on the area (McLaughlin and Mineau 1995); thus, organic aquaculture practices are promoted. However, despite its positive effects, adoption in the Philippines is slow; and only in January 2017 (BAFS 2017a) when two organic aquaculture farms have been certified as "organic". But both have not renewed their certification as of December 2017 (BAFS 2017b).

STATEMENT OF THE PROBLEM

This study was conducted to gain insights on the slow adoption of organic aquaculture in the country where Negros Occidental, the "Organic Capital of the Philippines" was profiled and the practices, constraints, and other concerns were evaluated. This paper aimed to present the status of organic aquaculture in the province and provide insights on the slow adoption of organic aquaculture. This study also provides essential information in crafting policies and programs to address the slow adoption, and to best promote organic aquaculture in the country. The major research questions are:

1. What are the profiles of organic aquaculture practitioners in the province?
2. What is their level of awareness on organic aquaculture principles and standards?
3. What are the experiences of organic aquaculture practitioners in terms of farm practices, problems, and concerns? and
4. What policies or programs can be implemented to address the slow adoption, and to best promote organic aquaculture?

METHODOLOGY

This study was conducted in the province of Negros Occidental in 2015 to evaluate the status of organic aquaculture in the province. Both primary and secondary data were used. Respondents were organic aquaculture practitioners who met the minimum organic aquaculture standards. Minimum standards included for consideration are: non-use of commercial feeds, inorganic fertilizers, and pesticides, genetically-modified organisms; and fish treated with hormones (BAFS 2012). Sampling techniques used were both purposive and snowball sampling. Baseline data were taken from the Office of the Provincial Agriculturist (OPA) of Negros Occidental; which the data included the list of organic aquaculture practitioners/farmers and their farm areas. The data were validated and updated in the Municipal/City Agriculture's Office (M/CAO) all over the province. Further, farmers were asked if they know other organic aquaculture practitioners who were not documented by the local government; additional undocumented organic aquaculture practitioners were also interviewed. Farm ocular inspections and one-on-one interviews with the farmers were undertaken to gather empirical data. This was conducted to validate, evaluate, and verify their practices. Farm practices were evaluated based on the revised Philippine National Standard 2016 (BAFS 2016b).

These researchers were accompanied by municipal Agricultural Technicians who have been working closely with the respondents, and have been familiar with their aquaculture farm practices. The semi-structured questionnaire administered comprised of questions regarding the demographic profile of the respondents, educational attainment and trainings related to organic farming, aquaculture production and farm area, when they started organic aquaculture, species cultured, water source, and feeds and fertilizers used. Farmers were also assessed based on their awareness on organic aquaculture and the PNS for organic aquaculture. Farm ocular inspections were done to observe the areas. Feeds and fertilizers used, and water sources were checked. Presence of animals and introduction of inorganic inputs such as commercial feeds, fertilizers, and pesticides were noted. Problems encountered e.g. market, water source, growth, etc., and other concerns of the farmers were documented to come up with insights on the slow adoption of organic aquaculture.

Awareness on organic aquaculture was categorized into "least aware" (knows the basic concept of organic aquaculture such as non-use of feeds and inorganic chemicals), "aware" (knows the basic concepts, RA 10068 and the effects of organic and conventionally produced fish to human health), and "in-depth aware" (knows the basic concepts, RA 10068 and the effects of organic and conventionally-produced fish to human health, its environmental impacts and the PNS). Also, awareness on PNS was categorized into "not aware" (does not know that PNS exists), "aware" (knows that there is PNS) and "in-depth aware" (knows some provisions under PNS).

FINDINGS

There were 18 organic aquaculture practitioners reported by the OPA as of 2014. An additional 46 was provided by the M/CAOs after a province-wide Local Government Unit surveillance in 2015. These farmers were dominated by tilapia growers representing 91 % while the remaining 9 % culture milkfish. Of the 64 supposedly organic aquaculture practitioners, 19 were considered compliant with the minimum standards. Of the 18 farms reported in 2014 as organic aquaculture practitioners, only 8 continued their organic aquaculture practice.

Out of 18 farms reported in 2014 (OPA Negros Occidental, pers. comm.), 10 have stopped their organic aquaculture operation, and therefore were omitted from the final list of organic aquaculture practitioners. The farms were either found non-complaint or have stopped their aquaculture practices due to several reasons. Others have become users of commercial feeds for faster growth and increased production; while others have stopped their aquaculture practices due to lack of seed and sufficient water supply. These show high possibility that organic aquaculture practitioners will go back to conventional practices to produce and have more profit. These experiences have been reported in the province among upland agriculture farms where farmers converted to organic farming went back to conventional practice (Olabisi et al. 2015).

The field study found that 19 out of 64 supposedly organic aquaculture farms were found compliant with the minimum standards considered. However, this does not guarantee compliance with third party certification. This only suggests that the farm is compliant with the minimum standards that have been included for consideration and is "potentially" for certification; provided that it will fulfill the standards set by certifying bodies i.e. OCCP and the Negros Island Organic Certification Services (NICERT).

Of the 19 farmers, ninety percent were males; only 10% were females. This suggests that males are more engaged in organic aquaculture than females. In the study of Adebo and Alfred (2008), males were found more engaged in tilapia production than females. Males are engaged in fish capture and culture while females are into the processing. On the contrary, females have a significant contribution in organic aquaculture. Though 90 % of the farmers are males, all were married. Some farms were found to have been managed by both the husband and wife; only, the husband directly involved in production and has more knowledge on the operation. Age of the farmers also ranged from 42-73 years old which suggests that no younger generations are involved in organic aquaculture in the area. Educational attainment was also varied from elementary level to college graduate that indicate the diversity of educational orientations among farmers engaged in organic aquaculture.

Organic Aquaculture Areas and Production

Initial data suggest that the province has a total of 8.69 ha farm area devoted to organic aquaculture in 2014 (OPA Negros Occidental, pers. comm.). This covers only about 0.07 % of the total 12,454.98 ha aquaculture production area (fresh and brackishwater) as of 2014 (Negros Occidental Fisheries Profile, unpubl. data). From 8.69 ha, it increased up to six times (52.262 ha) in 2015 based on the results of this study. However, it only represents 0.42 % of the total production area. Thus promotion of organic aquaculture still needs to be intensified.

With the total annual production of aquaculture products 11,186.96 MT (Negros Occidental Fisheries Profile, unpubl. data) in 2014 (from fresh and brackishwater aquaculture), an estimated 22.0 MT is contributed only by organically grown aquaculture products; reared in accord with the considered minimum standards. This production is more than 500 times lower than the results from conventionally produced aquaculture products. Some of the farmers have started organic aquaculture before 2014. These show that some of the farmers have already been practicing organic aquaculture but were not included in the 2014 list of practitioners. It is because some of them were based in mountainous areas; thus were not documented.

Organic Aquaculture Practices

Organic aquaculture production practices were evaluated based on the 2016 Revised Philippine National Standard. Table 1 presents the organic aquaculture practices in the province as to when the organic aquaculture practice was started, species cultured, water source, feeds used and fertilizers applied. Sixteen percent of the farms were established in the 19th century and the remaining 84 % in the 20th century. Species reared are tilapia and milkfish. Almost 68 % of the farmers culture tilapia while only 32 % are into milkfish. Water sources are spring, river (fresh and brackish), estuary, and rain water. The three mostly-used locally-available feeds are rice bran (62 %), river spinach (38 %), and termites (31 %). Fertilizers used are chicken manure, vermicast, carabao dung, mud press, and bagasse.

Table 1. Organic Aquaculture Practices in Negros Occidental Province

Farmer	Year Started Organic	Species Cultured	Water Source	Feeds Used	Fertilizer used
1	2008	Milkfish	River, BW	Lablab and lumot	Vermicast
2	2009	Tilapia	Spring	Rice bran	None
3	2008	Tilapia	River, FW	Rice bran and river spinach	None
4	2014	Tilapia	Spring	Lumot, termites and worms	None
5	2011	Tilapia	Spring	None	None
6	2013	Tilapia	Spring	None	None
7	2015	Tilapia	Spring	None	None
8	1998	Tilapia	Rain water	Rice bran, river spinach and decomposed rice straw	None
9	2008	Tilapia	Spring	Rice bran, river spinach, cassava, and sweet potato tops	Vermicast
10	2009	Milkfish	River, BW	Lablab and lumot	Chicken manure, mud press, vermicast and bagasse
11	2013	Tilapia	River, FW	Rice bran and river spinach	None
12	2013	Tilapia	River, FW	Rice bran, river spinach and termites	None
13	2013	Tilapia	River, FW	Termites	None
14	Before 2005	Milkfish	River, BW	Lablab and lumot	Chicken manure
15	2011	Milkfish	River, BW	Lablab and lumot	Chicken manure
16	Before 1975	Milkfish	Estuary	Lablab and lumot	Chicken manure
17	Before 1985	Milkfish	Estuary	Lablab and lumot	Chicken manure
18	2012	Tilapia	River, FW	Rice bran, termites	None
19	2013	Tilapia	River, FW	Rice bran and organic vegetable left-over	Carabao dung

Legend: (Before means: as far as the farmer could remember); (BW – Brackishwater); (FW – Freshwater)

Organic aquaculture practices differ among species. In organic milkfish farms, it takes more than a month before stocking takes place; while in tilapia farms, stocking could be done immediately as long as there is water in the pond. This is due to long term preparation of the ponds in milkfish farms as dike rehabilitation, drying, fertilization, and water culture in order to grow natural foods. However, organic tilapia practitioners in Negros Occidental put less priority in the growing of natural foods in ponds. Rather, they introduce organic feeds, either singly or in combination with naturally-available foods.

As shown in Table 1, organic aquaculture has started as early as 1975 as remembered; it is still emerging. This shows that organic aquaculture in the Philippines is more than 40 years in experience, an alternative to the use of inorganic chemicals. Of the 19 organic aquaculture farms, 16 % were established in the 19th century and the remaining 84 % in the 20th century. All in all, 47 % of organic aquaculture farms were established before RA 10068 (RA 10068 2010) was passed in 2010; 53 % thereafter. This presents almost the same number of organic aquaculture practitioners established before and after RA 10068 was passed despite its implementation. This indicates that the government and private sectors need more efforts, coordination, and collaboration to promote further organic aquaculture in the country. In addition, farms practising organic milkfish culture are in fact, extensive milkfish farms. In that case, extensive farms may be synonymous to organic farms; provided that no inorganic inputs are introduced. Although some extensive farms rely only on natural foods, others use inorganic fertilizers to enhance natural food growth; therefore these are not classified as organic aquaculture farms.

The abovementioned farms have passed the minimum standards considered. However, in organic aquaculture, numerous limiting factors are considered, which include water source and feeds used. For instance, water source and feeds used must have minimal or be free of inorganic chemicals/contaminants (BAFS 2012). In the province, water sources in organic aquaculture farms come from springs, rain water, rivers (fresh and brackish), and estuaries. Considering the type of water source, one can already have insights on the threats. The longer the surface water travels, the more it is susceptible to contamination. In rivers, downstream is more polluted compared to its midstream and upstream. It is because downstream serve as the sink of pollutants coming from the upper portions of the river (Moellenkamp 2007).

The water quality of the downstream depends on the midstream and upstream. Though the quality and level of pollution of water sources used by the farmers were not analyzed, spring water was the only source that is potentially free of inorganic contaminants. Nevertheless, even the farm's source is river waters, its upstream can be a good water source. Bearing in mind the threats of contamination through the water source, only 32 % (brackishwater milkfish farms) of the farms are more susceptible to contamination. Hence, more than 60 % of the farms use spring water as their source. According to Swann (1992), springs are generally classified as the best source of water for aquaculture.

The feed/food used depends on species cultured. Milkfish farms (brackishwater) use natural food such as lumot and lablab, with growth enhanced by application of organic fertilizers. The Food and Agriculture Organization of the United Nations (1986) defined lablab as a kind of microbenthos composed of blue-green algae, diatoms, and other microscopic plants and animals while lumot is composed mostly of filamentous algae such as Chaetomorpha. Three mostly-used locally-available feeds are rice bran, river spinach, and termites, with 62 %, 38 % and 31 % farmers using these respectively. The least-used organic feeds are lumot, decomposed rice straw, sweet potato tops, cassava tops, and organic vegetable leftovers. Rice bran is the widely used feed. It is economically viable, because it is cheaper and is locally available. However, commercial rice bran is a by-product of rice farming from conventional farms. In that case, rice bran may contain inorganic chemical residues; which are regulated under PNS (BAFS 2012). In one of the findings of Chen et al. (2007), organochlorine pesticides in rice bran is higher compared to rice. Aside from that, rice bran was also found to have greater amounts of heavy metals than polished rice e.i. cadmium (Zhang et al. 1998). Yet, even trace amounts are present in rice bran, continuous feeding may accumulate it. On the contrary, rice bran is the only fish feed used to have greater amounts of chemical residues. The remaining mentioned organic foods are recommended such as river spinach, termites, lumot, lablab, sweet potato tops, cassava tops, and organic vegetable left overs, provided these do not come in direct contact with inorganic contaminants; with considerations on its protein contents, and plant antinutrient properties for better growth performance.

Fertilizers used to enhance natural food growth in milkfish farms are chicken manure, "mud press", bagasse, and vermicast. Among the above-mentioned fertilizers chicken manure is the most widely used. However, it poses the biggest risk being known to introduce contaminations. In the study by Zhao et al. (2010), it was revealed that chicken manure has greater amounts of antibiotic residues compared to pig and cow manures. High concentrations of heavy metals were also found in animal manures from poultry and livestock farms (Cang et al. 2004). Even if farms have passed the minimum standards, the risk of contamination is still high because chicken manure is used as fertilizer, especially most supply come from conventional farms. For precautionary measures, fertilizers to be used should be analyzed for inorganic chemical contamination. For organic tilapia farms, only 10% were using organic fertilizers (vermicast and carabao dung). Twenty-tree percent of the farmers neither fertilize the water nor feed the fish. This aquaculture practice is locally known as "palanas" (Hiligaynon). Tilapia fingerlings are stocked into the ponds without management and harvested after 6-12 months, depending on the need of the farmers. This practice was classified as organic, based on non-use of inorganic feeds and chemicals. The rest of the farms did not practice pond fertilization for natural food growth but rather introduced organic feeds.

Organic Aquaculture Awareness

The farms have passed the minimum standards. However, this is not an assurance of being certified as organic. As discussed above, the entire set of standards must be considered (PNS, OCCP and NICERT). However, the standards will not be met if the farmers are not aware of the criteria. Most of the farmers were aware of the basic concepts of organic aquaculture, RA 10068, and the effects of organic and conventionally produced fish to human health and the environment; only 10% were least aware. Only two were identified having in-depth awareness because of their deeper knowledge in organic farming. More importantly, the trainings on organic farming conducted by the local and national governments, and non-government organizations attended by the farmers also helped them enhance their level of information. Half of the farmers were not aware of the PNS. It was observed that farmers who have attended courses, trainings, or seminars on organic farming are aware of the PNS; those who have not attended are not aware. This suggests that farmers are only aware of the PNS, which is the key to organic certification, because they have been informed through courses, trainings, and

seminars on organic farming. Such weakness in information access limits the promotion and adoption of organic aquaculture in the province. Even in the agriculture side as cited by Olabissi et al. (2015), access to information, technology, organic inputs, credit and market have greatly affected the sustainability of farms that converted into organic farming.

Problems, Constraints, and Interventions

Results suggest that organic aquaculture existed in the province before the 1980's However, lots of challenges have emerged. It is in the creation of the RA 10068 that organic farming was strengthened. Some of the problems identified by the farmers are being addressed by the government, research institutions and other stakeholders. Despite the efforts from different sectors, organic aquaculture practitioners still go back to conventional practice due to many factors. Government initiatives and future priorities were also included. Interventions have been started, such as the lowering of organic certification standards from PNS 2012 to the Revised PNS 2016 (BAFS 2012; BAFS 2016b). Researches and technology trials is being conducted by agencies such as BFAR and the Southeast Asian Fisheries Development Center, Aquaculture Department. Certification subsidy is also offered by the Department of Agriculture to potential organic farms (Department of Agriculture, 17 June 2015). Problems encountered by farmers in Negros Occidental are discussed below.

Slow growth, lesser fish biomass. The farmers stated that fish species reared in organic environment has slow growth and lesser biomass compared to conventional produce. Therefore, a longer culture period is required to reach marketable size. This problem was proven by farmers who have experienced conventional farming before deciding to go into organic aquaculture. It is the result of low-protein locally-available feeds such as rice bran, water spinach, etc. that are fed to the cultured species. This has induced some organic aquaculture practitioners to go back to their conventional practices for greater income and shorter production period; the same in organic agriculture reported by Olabissi et al. (2015). Feed formulation activities have been started and currently being pushed by the Philippine Government through the approval of the PNS for Organic Feeds (BAFS 2016c). However, accessibility to organic feeds and capacity to produce high-protein formulated feeds is far viable among local farmers, both technically and economically. Availability of commercial organic feeds is also lacking but an essential move to promote sustainability of organic aquaculture.

High price of organic product and lack of local organic market posts. Organic products can be priced higher compared to conventional produce despite difference in biomass because of its longer culture periods. However, higher prices of organic products also affect the preferences of consumers with lower budgets. In some countries such as Greece, organically-grown products are priced higher compared to conventional produce (Perdikaris and Paschos 2010). Therefore, they suggested that market-based initiatives should be established to improve market acceptability and promotion of the product. According to the OPA Negros Occidental (OPA Negros Occidental, pers. comm.), there were two organic market posts located in Bacolod City. Nonetheless, it is not accessible for upland farms and those far from the city to market their products in the said market posts; it also adds-up to travel costs. The lack of local organic market posts, organic aquaculture products are displayed alongside conventional products. Farmers cannot demand a higher price, and the product is susceptible to cross contamination. One way to mitigate such problems is the establishment of local market-based initiatives such as establishment of trading posts for accessible market, and separation of organic and conventional produce to prevent cross contamination. The lack of awareness on the positive impacts of organic aquaculture in human health and environment may result in less appreciation of organic aquaculture products, thus market niche has not yet been stabilized. Organic produce in some areas are priced at par with the conventionally-produced. Proper dissemination of organic aquaculture principles, technologies, and certification standards should be conducted to increase awareness among farmers and consumers. In the study of Aarset et al. (2004), consumers' lack of knowledge on the concepts of organic aquaculture products have significantly affected marketability or organic products. Thus consumers, aside from farmers should be educated on the basic concepts of organic aquaculture including its health and environmental benefits.

Organic aquaculture farms are prone to contamination. There are numerous sources of contaminants that could affect an organic aquaculture production system. Among the farms in the province, those in brackishwater are more susceptible to contamination e.g. waste products of sugar centrals, run-off water from inorganic rice and fish farms, domestic wastes, etc. It is because, open

water systems such as rivers are easily contaminated with inorganic chemicals (Brister and Kapuscinski 2001) which may enter the river system and contaminate the water source for brackishwater farms. Environmental laws and water waste disposal should be properly regulated and implemented. Separate waterways for conventional and organic farms are a good option to avoid water contamination. Promotion of organic aquaculture zones is another way to avoid contamination between conventional and organic farms. Upland areas are also good for organic aquaculture production due to lesser contaminants. Likewise, conduct of researches for new technologies in organic aquaculture farms to avoid contamination (e.g. establishment of settling ponds, placing macrophytes at the mouth of the river or on the water supply canal, putting biofilters, etc.) could increase the success of organic aquaculture in brackishwater areas.

Lack of continuous fingerling supply. In any aquaculture production system, fingerling supply is necessary to continue the operation. Some of the farmers do not change their stocks, allowing the standing stock to reproduce for continued production, therefore, resulting in inbreeding. It is important to establish hatcheries where lots of practitioners are based nearby or to capacitate the farmers and help establish their own hatcheries to sustain production cycles.

Weak awareness in the principles and standard for organic aquaculture. It is hard to comply with any standard if one is not aware of its parts and provisions. Farmers in the province believe that their practice is organic farming. However, it was found out that many farms do not comply with the standards, thus, many were omitted from the final listing. The lack of awareness in the principles and standards for organic aquaculture has led to non-compliance with the minimum standards to be classified as "organic". Additionally, there were no reports among aquaculture farms in the province that applied or wished to apply for organic certification. Piadozo et al. (2014) stated that low level of awareness and accessibility to support services from the private sector, and the government has resulted in poor PNS compliance which is critical for the sustainability of the organic agriculture program in the country. A nationwide organic aquaculture awareness program will be a good move to increase consciousness among farmers and consumers on what organic farming really is all about.

Minimal support from selected local government units. According to farmers, the local government in some areas puts less priority for organic aquaculture. Their complaints on the poor implementation of environmental laws and regulations especially on water contaminants is not addressed by selected local government units and other concerned agencies. Despite the strong promotion of organic farming in the provincial level, local governments in the city and municipal levels are essential in the sustainability of organic aquaculture production.

High organic certification standards. The high certification standard (BAFS 2012) has resulted in hesitation among farmers to pursue third party organic certification. Farmers are afraid of not passing the standard, thus none of the aquaculture farms have been certified as of 2015. Therefore, in 2016 the PNS for organic aquaculture was revised, and some of the provisions were toned down. As of January 2017, two organic aquaculture farms have been certified organic. Yet, sustainability is another matter since by December 2017 (BAFS 2017b), none of these aquaculture farms have renewed their certification.

High organic certification cost. High cost of organic certification has also resulted in hesitations and negative response from some of the farmers. As a government initiative to assist organic certification process, the Department of Agriculture has passed Department Circular No. 04, Series of 2015 (DA 2015). The Department seeks to provide financial and technical assistance to potential farms, and be certified as organic. However, due to lack of knowledge of the standards and non-compliance of farm practices, farmers still hesitate to apply for certification subsidy.

Currently, the benefits of producing organic aquaculture products in some areas in Negros Occidental could be observed in the market. Organically-produced milkfish is preferred by consumers compared to the conventionally-produced due to the former's palatability. Nevertheless, a survey on consumers' preferences needs to be conducted. According to respondents, most of milkfish producers, brokers, and consumers in the province are aware of color differences between organic which are greenish in color, and conventionally-produced milkfish which are pale. In addition, most of the brokers know the physical characteristics of the organically-produced; thus privilege is given by not lowering the original price unlike the conventional. For instance, if the milkfish farmgate price is Php 90.00, conventionally-produced could be priced lower e.g. Php 85.00 or 70.00. However, the price of organic milkfish is stable. For organic tilapia, the production practice is very

economical. Tilapia can be produced with lower investments especially when utilizing locally-available feeds, and fingerlings produced within the farm.

CONCLUSIONS

In spite of the title as the "Organic Capital" of the country, Negros Occidental has its struggle in converting conventional aquaculture farms into organic even after the approval of RA 10068.

1. The province needs more efforts in keeping organic aquaculture practitioners not to go back to their previous conventional practice.
2. The passion of the farmers and the commitment of the stakeholders, provincial and national agencies, non-government organizations to promote organic aquaculture could be seen in terms of farmer's awareness and therefore should be strengthened.

RECOMMENDATIONS

Initiatives from the government, private sector and other stakeholders should be increased for the development and promotion of organic aquaculture in the province.

1. An increased awareness campaign should be increased especially on the principles and standards of organic aquaculture which is vital to improve their chances to be certified.
2. Future studies on consumer awareness regarding health impacts of organic and conventional products can provide insights on the market niche and how to best promote organically-produced aquaculture products.
3. Establishment of organic zones for organic aquaculture is a good move to sustain the production without the threat of contamination.
4. It would be good option to focus the development of organic aquaculture in freshwater areas with less threats of contamination while ongoing research on the feasibility of organic systems in brackishwater fishponds and open marine areas are being conducted.

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MATHEMATICAL PROBLEM SOLVING ABILITY OF THE COLLEGE OF ARTS AND SCIENCES STUDENTS AT ILOCOS SUR POLYTECHNIC STATE COLLEGE, TAGUDIN CAMPUS

Jacqueline G. Gumallaoi
Head for Research & Extension
College of Arts and Sciences
Ilocos Sur Polytechnic State College
Tagudin, Ilocos Sur

ABSTRACT

The Mathematical problem solving ability of the College of Arts and Sciences students at Ilocos Sur Polytechnic State College was determined through a teacher made test. Further that in this study, the profile of the respondents as to: sex, type of school graduated, attitudes towards Mathematics, learning style, study habit, emotional quotient(EQ) and grade in college algebra, significant relationship to the level of Mathematical problem solving ability and its' predictor were identified. Frequency count, percentage, rank order, weighted mean, documentary analysis, correlation analysis and stepwise linear regression were the statistical tools used in this study. The study came out with the following results: most of the students were females and graduates of public high school; their learning style fell on the category of being visual; their emotional quotient was "high"; their study habits were described as moderately favorable and their level of Mathematical problem solving ability were rated as "fair". On the relationship between the profile and level of problem solving ability, the following revealed a correlation: sex to analysis, type of school to algebraic skills, attitudes towards mathematics to vocabulary, algebraic skills and analysis, study habits to analysis and synthesis. On the Predictors of Mathematics problem solving ability, Attitude towards Mathematics was the significant single predictor of Mathematics problem solving ability.

Keywords: Problem Solving ability, College Algebra, Predictor, attitudes toward mathematics, general skills.

INTRODUCTION

Over the last few years issues connected with learning and teaching Mathematics has become a matter of the highest importance for everyone involved in education, training and publishing. It has been taken up at the highest policy level. Mathematical competence has been identified by the European Parliament and the Council of the European Union as one of the key competences necessary for personal fulfillment, active citizenship, social inclusion and employability in modern society.

Recently the deteriorating quality of Mathematics education poses serious problems not only to the schools but to the community at large, since Mathematics plays a very important role in the progress of the nation (Gabriel, 2012).

Furthermore, De Vault (1987:12) claims that problem solving in Mathematics like writing in the language arts requires competence with certain basic skills or tools. Clearly, one cannot solve any Mathematical problem with some notion of the basic facts, without competence in computation, understanding of operations or the ability to sequence tasks in logical order.

Thus, this world calls for proper training and guidance towards the maximum development of student's ability and skill in solving Mathematical problems.

Generally, the major focus of Mathematics curriculum has been on computation, not on problem solving. Reports reveal that although the students can compute, their problem solving skills are poor.

For almost eight (8) years that the researcher has been teaching Mathematics subjects, she has observed that Mathematics is the waterloo of the students. In the College of Arts and Sciences, where the researcher is a core faculty, she is al-

ways hard up in motivating the students to have positive attitude towards mathematics subject. Students in this college fear Mathematics especially problem solving and even the mathematics major are very hard up in solving worded problems. Although Mathematics teachers keep on applying strategies learned in seminars and training and to the extent of giving more simple and step by step solutions just to help students understand Mathematics clearly and easily, still student's performance in Mathematics has been low as manifested in their seat works, quizzes and final grades.

It was in this context that the study was anchored. The researcher sought to find out the Mathematical problem solving ability of the College of Arts and Sciences first year students in order to come out with recommendations for improvement.

The result of the study will be utilized by the School Administrators as basis for informed and researched-based decision-making for policy makers of the college in strengthening the Mathematics program. This study is significant to the Researcher herself in her service oriented profession of educating the youth. It will be used to improve herself professionally; that is, to work towards competence in teaching Mathematics specifically in problem solving and to develop the students in the different skills needed to improve their problem solving abilities.

STATEMENT OF THE PROBLEM

This study sought to determine the level of mathematical problem solving ability of the College of Arts and Sciences first year students enrolled at Ilocos Sur Polytechnic State College, Tagudin Campus, Tagudin Ilocos Sur during the academic year 2016-2017.

Specifically, this research answered the following questions:

1. What is the profile of the respondents as to:
    a. sex;
    b. type of School Graduated from;
    c. attitudes towards Mathematics;
    d. learning Style;
    e. study Habit;
    f. emotional quotient;
    g. grades in college algebra?
2. What is the Mathematical Problem-solving Ability level of the Bachelor of Arts and Sciences students in terms of:
    a. mathematical vocabulary;
    b. algebraic skills;
    c. analysis;
    d. synthesis; and
    e. general skills?
3. What is the congruence between the profile of the respondents and their level of problem solving ability along considered dimensions?
4. Which of the aforementioned variables predict the Mathematical problem solving ability of the respondents?

METHODOLOGY

The study was conducted at the College of Arts and Sciences of Ilocos Sur Polytechnic State College, Tagudin campus, Tagudin, Ilocos Sur from the month of December 2017 to August 2018. The total population of 194 first year students enrolled in the College of Arts and Sciences was used. The questionnaire was the main tool in gathering the data that was distributed to the students who had enrolled in the subject College Algebra. The students' questionnaire consisted of five (5) parts. Part I deals with the profile of the respondents. Part II dealt with the attitude toward Mathematics subject. The questionnaire on the attitude towards Mathematics was taken from the study of Gumallaoi(2012). The positive attitudes deal with favorable attitudes toward Mathematics while the negative attitudes deal with unfavorable attitudes towards Mathematics. Part III dealt with learning style. Instrument for learning style was taken from Rivera (2010). There were three (3) learning styles namely: visual or verbal, active or reflective and sequential or global. The learning style of the students was the highest weighted mean. Part IV dealt with the student's study habits. The checklist on study habits was lifted from the study of Pamani (2006). Part V dealt with the respondent's Emotional Quotient (EQ) which was lifted from the study of Gumallaoi (2012). The grades in College Algebra were taken from the records of the registrar. To determine the Mathematical problem solving ability of the college freshmen, the researcher administered a problem solving ability test along vocabulary, algebraic skills, analysis, synthesis and general skills. The test was checked and validated by five (5) Mathematics instructors. The teacher made test was based on the course outline of Math 101 College Algebra as used in the course syllabus of Ilocos Sur Polytechnic State College. To categorize the data, the following ranges were used:

A. Attitudes towards Mathematics

Point Value	Range	Descriptive Equivalent
5	4.20 – 5.00	Positive
4	3.40 – 4.19	Positive
3	2.60 – 3.39	Negative
2	1.80 – 2.59	Negative
1	1.00 – 1.79	Negative

B. Learning Styles

Point Value	Range	Descriptive Equivalent
5	4.20 – 5.00	Always (A)
4	3.40 – 4.19	Oftentimes (O)
3	2.60 – 3.39	Sometimes (SO)
2	1.80 – 2.59	Seldom (SE)
1	1.00 – 1.79	Never (N)

C. Study Habit

Point Value	Range	Descriptive Equivalent
5	4.20 – 5.00	Very Much Favorable (VMF)
4	3.40 – 4.19	Favorable (F)
3	2.60 – 3.39	Moderately Favorable (MF)
2	1.80 – 2.59	Fairly Favorable (FF)
1	1.00 – 1.79	Not Favorable (NF)

D. Emotional Quotient

Point Value	Range	Descriptive Equivalent
5	4.20 – 5.00	Exceptional (E)
4	3.40 – 4.19	Very High (VH)
3	2.60 – 3.39	High (H)
2	1.80 – 2.59	Low (L)
1	1.00 – 1.79	Very low (VL)

E. Grade in College Algebra

Range	Descriptive Equivalent
1.25 – 1.00	Excellent (E)
1.75 – 1.50	Very Good (VG)
2.25 – 2.00	Good
2.75 – 2.50	Fair
3.00	Passing

F. Correlation Coefficients

Range	Strength of Association
±0.1 - ±0.3	Weak
±0.31 - ±0.5	Moderate
±0.51 - ±1.0	Strong

The data gathered were tabulated, computed, and analyzed. Frequency counts, weighted means, percentages and ranking were used for treating sub – problems 1 and 2. For sub-problem number 3 on the congruence between problem solving ability along vocabulary, algebraic skills, analysis, synthesis and general skills and the independent variables; sex, type of school graduated, attitudes toward Mathematics, learning style, study habit, emotional quotient and Grade in College Algebra, the Pearson Product Moment of Coefficient of Correlation (Pearson r) was used using SPSS software. For sub-problem number 4, Stepwise Multiple Regression was used using the SPSS software.

Ethical Aspects

Permission was requested and obtained in writing from the College of Arts and Sciences Dean as well as from the students to conduct the research and publish the findings. The assurance was given that no individual would be identified.

FINDINGS

Profile of the College of Arts and Sciences first year students.

Table 1. Profile of the College of Arts and Sciences first year students

Personal Profile		f	%	Rank
a. Sex				
Male		49	25.26	2
Female		145	74.74	1
Total		194	100	
b. Type of school graduated				
Public		168	86.60	1
Private		26	13.40	2
Total		194	100	
c. Grades in College Algebra				
	DER			
1.25-1.00	Excellent			
1.75-1.50	Very Good	1	0.52	5
2.25-2.00	Good	18	9.28	3
2.75-2.50	Fair	106	54.64	1
3.00	Passing	64	32.99	2
4.00	Conditional	5	2.57	4
5.00	Failure			
Total		194	100.00	

Table 1 reveals that the freshmen students were dominated by female. This study is parallel to the findings of Dela Cruz (2011) that male students are outnumbered by female in colleges and universities. Due in part of the higher rates of female enrollment; women are also more likely than men to obtain a college degree. In addition to the concern expressed by higher education officials, some research demonstrates that the gender composition of students' schools and classrooms can influence their achievement and attainment and that these effects may differ for males and females. Most of the first year students were gradu-

ated from public high schools. The finding indicates that most of the public high school graduates will pursue their higher education in the same public tertiary school where education is not too expensive. Further that, recent surveys say that the rate of public school students entering college after graduation has fluctuated between 62-67% in recent years. A variety of factors come into play which result in that relatively low matriculation rate. The dropout rate in public schools tends to have a negative effect on matriculation data. (http://www.choosingaschool//comparison.com).
Majority of the students' grade in college algebra were described as "fair" and many also had a grade described as "Passing. This means that the students are not ready to face the different activities encountered in Problem Solving in College Algebra. The students' "fair" and "Passing" grade indicates that they were not able to retain their learning in high school especially in their Mathematics subject.

Attitude Towards Mathematics.

All the indicators on the student's attitudes toward Mathematics subject have a descriptive rating of negative. All most of the student's responses have a mean score described as negative. This negative attitude creates a feeling of rejection of the subject and eventually affects the student's competence in the subject. The findings affirmed to Lacasandile (2013) that a student with a negative attitude towards Mathematics would not do better in Mathematics. This means that Mathematics subject does not capture the interest of the students. This is because the fact that Mathematics is a difficult subject and is the waterloo of many students. It involves a lot of thinking and patience in computing. It requires much effort on the part of the students to arrive at a correct answer. Since Mathematics is an exact science, one cannot just present an answer from one point of view without the presence of long and accurate solutions. Generally, all the indicators are described as "negative". This implies that the respondents had an attitude that Mathematics is not for them or they were not born to be good Mathematicians, thus, affected their performance in the subject. Since attitude toward mathematics significantly affect the mathematical problem solving ability of the students, teachers should adopt varied instructional strategies to cater to individuals differences as well as develop positive attitude and values of the students.

Table 2. Attitudes towards Mathematics

Indicators	Mean	DER	Rank
1. Mathematics is very interesting to me.	2.01	N	6
2. Mathematics is fascinating and fun.	1.81	N	8
3. I enjoy seeing how rapidly and rapidly and accurately I can work out math problems.	2.58	N	3
4. Mathematics is something which I enjoy a great deal.	2.35	N	5
5. When I hear the word math, I feel challenged.	1.85	N	7
6. I really like mathematics.	1.90	N	
7. I am happier in a mathematics class.	2.42	N	4
8. I feel at ease in a mathematics class.	3.50	N	1
9. Mathematics is as important as any other subject.	2.82	N	2
10. I feel a definite positive reaction to mathematics.	1.77	N	9
Overall mean	**2.30**	**N**	

Legend:
DER Descriptive Equivalent Rating
N Negative

Learning Style

Most of the first year students are classified as visual or verbal learners. This means that the students are visual or verbal learners. Verbal learners learn most thoroughly and efficiently, when material is presented to them audibly. They retain information if they repeat it audibly to themselves what they were taught. Just as Active learners, verbal learners often retain the information given through repetition when they discuss or explain the material to others. Just as Active learners, verbal learners are often interpersonal. They would rather have someone explain in detail how to accomplish a task, rather than view a physical, visual demonstration. Verbal learners often prefer to learn through reading. They may read aloud to themselves for more efficient comprehension.

Teachers often use their preferred learning style as their main mode of teaching and if students do not share those same preferences then learning can be very difficult and frustrating.

Understanding how student learn is perhaps one of the most important tasks a teacher and parents can undergo. Another is how the teacher designs a teaching – learning environment to match the learning style of the students. This is what differentiated instruction enters. Differentiated instruction also known as differentiated learning is a framework for effective teaching that involves providing all students within their diverse classroom community of learners a range of different avenues for understanding new infor-

mation in terms of: acquiring content, processing, constructing, or making sense of ideas; developing teaching materials and assessment measures so that all students within a classroom can learn effectively, regardless of differences in ability.

Table 3. Learning Style

Learning Style	Mean	Descriptive Equivalent Rating	Rank
Visual or Verbal	3.74	Oftentimes	1
Active or Reflective	2.42	Seldom	3
Sequential or Global	2.75	Sometimes	2
Over-all mean	**2.97**	**Sometimes**	

Study Habits

The grand mean of the study habits is described as "moderately favorable". This means that generally, the students are aware of the appropriate way and the best place to study. As stressed by Rivera (2010), learning cannot be efficient unless the students are trained to know how to study under desirable conditions. Much of their school work are done at home, hence, students should have correct study habits, a room of their own free from noise other distractions, and most important, a study schedule.

Table 4. Study Habit of the college of arts and sciences freshmen

Indicators	Mean	Descriptive Equivalent Rating	Rank
1. Where to study	3.69	Favorable	1
2. When to study	2.76	Moderately Favorable	3
3. How to study	3.28	Moderately Favorable	2
Over-all mean	**3.25**	**Moderately Favorable**	

The key to becoming an effective student is learning how to study smarter, not harder. The vast majority of successful students achieve their success by developing and applying effective study habits. Further, successful students schedule specific times throughout the week when they are going to study – and then they stick with their schedule. Students who study sporadically and whimsically typically do not perform as well as students who have a set study schedule (Becton,L).

Emotional Quotient.

The emotional quotient (EQ) of the respondents is described as "very high". This means that most of them can control their emotions which are their very asset in attaining success in their studies. The findings lend support to that of Pamani (2006) when she found that if a student is emotionally stable while performing a certain activity he could easily perform such activity efficiently and effectively. He remains motivated, hopeful and optimistic despite setbacks in working towards goal.

According to Dueweiz and Higgs (1998) as cited by Gadaf,R and Besar,B (2017) research people with high level of Emotional Quotient experiences more career success.

Researcher Song and colleagues (2010) explored hoe emotional intelligence and cognitive intelligence affect college students' academic performance and social interactions. They found that, while IQ is of course a strong predictor of academic success, EQ also makes its own unique contribution. Further EQ is a significant factor in the quality of social interactions with peers, while IQ does not seem to have much of a role in a college student's social life.

Table 5. Emotional Quotient (EQ)

Indicators	Mean	DER	Rank
1. I stay relaxed and composed under pressure	3.45	VH	9
2. I can identify negative feelings without becoming distressed.	3.84	VH	8
3. I stay focused (not lost in unimportant details or procrastination) in getting a job well done.	4.01	VH	4
4. I freely admit to making mistakes.	4.09	VH	2
5. I can delay gratification in pursuit of my goals instead of getting carried away by my impulses.	3.86	VH	6
6. When I'm anxious about a challenge, such as a test o public talk, I find it difficult to prepare well.	4.24	E	1
7. Instead of giving up in the face of setbacks or disappointments, I stay hopeful and optimistic.	3.72	VH	7
8. I communicate my needs and feelings honestly.	3.38	H	10
9. I can pull myself together quickly after a setback.	3.08	H	11
10. I am aware of how my behavior impacts others.	3.97	VH	5
11. I pay attention and listen without jumping to conclusions.	4.05	VH	3
12. I take regular time out to reflect on my core purpose and vision for how I want to live my life.	2.80	H	12
Overall Mean	**3.71**	**VH**	

Legend:
DER *Descriptive Equivalent Rating*
H *High*
VH *Very High*

Mathematical Problem Solving Ability

The findings show that the mathematical problem solving ability of the students in all dimension were rated as "satisfactory". This result indicates that the ability of the students to solve mathematical problems is very difficult. It is believed that their abilities in the aforementioned

skills namely: mathematical vocabulary, algebraic skills, analysis, and synthesis skill tend to affect much their general skills. Another factor to be considered is the foundation of the respondents in Mathematics. This means that the stronger the foundation of the students in Mathematics the better is his ability in solving mathematical problems. This implies that there is a need to improve the ability of the respondents in the five dimensions considered in this study. It is very evident that the overall mathematical problem solving ability of the respondents depends much on their abilities in the five dimensions.

Dendane (2009) concluded that many skills and factors are involved when genuine mathematical problems are being solved. Instructors have to understand and be familiar with these factors and skills. He further stressed that instructors need to design activities and guide students to develop and use these skills. It is also possible to design problems that focus on a limited number of skills and factors. Students develop these skills only if genuine mathematical problems solving is taking place. The solved examples in the textbooks give the idea that problem solving is a linear process with no false start or illogical attempts. Also the way the solution is presented does not show how much time a useful solution. Even the problems suggested at the end of the problems suggested at the end of a chapter are usually the same type as those already solved.

Table 6. Problem Solving Ability of the college students

Indicators	Mean	Descriptive Equivalent Rating
1. Vocabulary	5.34	Satisfactory
2. Algebraic Skills	5.93	Satisfactory
3. Analysis	4.68	Satisfactory
4. Synthesis	5.58	Satisfactory
5. General Skills	4.08	Satisfactory
Overall-mean	**5.12**	**Satisfactory**

Congruence Between Mathematical Problem Solving Ability Dimensions and Students' profile

Table 7. Congurence between Mathematical Problem Solving Ability and students' profile

Mathematical Problem Solving Abilities	Sex	Type of School	Attitude toward mathematics	Learning style	Study Habits	Emotional Quotient	Algebra Grade
Vocabulary	.027	.037	.216*	.028	.037	.021	.055
Algebraic Skills	.140	.151*	.276*	.075	.039	.020	.004
Analysis	.205*	.119	.166*	-.102	.153*	.080	.024
Synthesis	.120	.019	.119	.103	.157*	.033	.013
General Skills	.062	.006	.043	.069	.021	.019	.043

* correlation is significant at .05 level (two tailed)

Table 7 reveals the variables which have significant correlation to the mathematical problem solving dimensions. Vocabulary has significant relationship to attitude towards mathematics; algebraic skills to type of school graduated from and attitude towards mathematics; analysis to attitude towards mathematics and study habits; and synthesis to study habits. This means that the variables which are correlated to the mathematical problem solving dimensions are contributory factors that can affect the performance of the students in problem solving.

Findings of Silao (2018) revealed that there is a significant relationship between the problem solving skills and the pupils mastery of the basic skills, attitude towards mathematics, and parental involvement. The findings imply that nearly mastered level of basic skills of the pupils contributed to the nearly mastered level of problem solving skills. Silao further discussed that the fair attitude of the respondents had as a significant relationship between pupil factor and problem solving skills when analysed according to attitude.

Predictor of Mathematics Problem Solving Ability.

The finding shows that the attitude towards Mathematics is the only contributor to the Mathematics problem solving ability of the students as proven by the results of the correlation analysis. The result implies that there exist a positive and a minimal significant relationship between the students' attitude towards Mathematics and their problem solving ability. The R2 values denote the prediction of the independent variable to that of Mathematics problem solving ability. As such, 5.9 percent of the Mathematics problem solving ability of the student can be attributed to their attitude towards Mathematics, 94.1 percent may be due to other factors. Moreover, the attitude towards Mathematics is not a perfect predictor of Mathematics problem solving ability. In as much as the

manner of attitude towards Mathematics emerged to be the first variable to enter the regression model, this can be thought of as the single predictor of mathematics problem solving ability in this research. It can be deduced that the success of the students in Mathematics problem solving ability can be attributed to their attitude towards Mathematics.

Table 8. Predictor of Mathematics Problem Solving Ability

Variables	R	R^2	F-Value	P-Value
1. Student Profile a. Attitude towards Mathematics	.243	.059	12.003	.001[a]

a. Predictor in the model: (constant), attitude towards Mathematics
b. dependent variable: MPSA

Meece and company (1990) found out that math ability perceptions directly affect students' valuing of math as well as their expectancies for success in math. Concerning predictors of math anxiety, they found that students' current performance expectancies in math and, to somewhat lesser extent, the perceived importance of mathematics have the strongest direct effects on their anxiety.

CONCLUSIONS

Based on the findings of the study, the researcher arrived at the following conclusions: 1) the College of Arts and Sciences first students possessed varied characteristics of sex, type of school graduated from, attitudes towards mathematics, learning style, study habit, emotional quotient and grades in college algebra, 2) the first year students can adequately perform the following skills; mathematical vocabulary, algebraic skills, analysis, synthesis, and general skill, 3) Mathematical problem solving ability of the first year students was dependent upon attitude towards mathematics, 4) attitude towards mathematics when taken collectively can predict the students' mathematical problem solving ability.

RECOMMENDATIONS

On the basis of the findings and conclusions drawn, the following recommendations are proposed: 1) Since attitude towards mathematics is a factor that can affect the performance of the students in solving mathematics problems, instructors should design varied learning activities or adopt the differentiated instruction concept to cater the different abilities of the student, so as to develop positive attitudes towards mathematics. 2) All the mathematical problem solving ability dimensions were described as satisfactory, this entails that mathematics instruction in the college should be strengthen through different activities like math wizard quiz bee in the event organize by math clubs, math capability building seminars and other activities that can challenge the mathematical solving ability of the students. 3) Instructors should emphasize the importance of original, quality thinking rather than rote manipulation of formulas and this stipulated in the design of their course syllabus. 4) It is recommended that a tie up effort among math clubs officers, students, instructors, administration and outside linkages should be encouraged.

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HIDDEN CURRICULUM IN PRIVATE AND PUBLIC UNIVERSITIES AND COLLEGES IN BICOL REGION

Jayson M. Danas, Ed.D.
Director
Research Extension Production and Entrepreneurial Development Affairs
Central Bicol State University of Agriculture

ABSTRACT

The inadequacy of empirical evidences that examine the aspects, forms, understandings, and applications of Hidden Curriculum resulted from the lack of its research interest in Higher Education Institutions. This prompted the study to focus on the Hidden Curriculum of Private and Public Universities and Colleges in Bicol Region. Data were collected through in-depth interviews and survey questionnaire. The descriptive and comparative method of research showed that respondents from selected universities and colleges believed that students have an outstanding participation in extra-curricular activities, and high satisfaction in school physical facilities, teaching and non-teaching employees' working behavior. It further showed that there is no significant difference in students' participation in hidden curriculum between schools, but significant difference was observed among its aspects. Variations on the aspects of Hidden Curriculum were significantly influenced by the type of school. Conversely, sufficient evidence and findings revealed that the multi-faith services, availability of internet services, and personal conduct of the teaching and non-teaching employees should be improved to ensure that excellent quality services will be provided to its clientele and stakeholder.

Keywords: Hidden Curriculum, Extra-Curricular Activities, Satisfaction to Physical Facilities, Teaching and Non-teaching Employees Working Behavior, Higher Education Institution .

INTRODUCTION

The 21st Century brought inevitable challenges and significant changes to the human society regardless of its structure and dynamics. It causes changes even in the minutest foundation of humanity that necessitate the people to align their perspective with these unavoidable changes. Increased global competition, technological advancement, and societal reforms prompted the people to become more competitive for survival. It compels people to collaborate, use information technology measures, and develop their creative and logical thinking in order to survive the stiff global competition.

Educational institutions as catalyst of change are believed to be one of the important components of the society that is responsible in preparing the people to survive and answer many problems across their time. To ensure that these educational institutions will perform its gigantic role, laws, regulations and standards are being established. For instance, the section one and two of the 1987 Philippine Constitution Article XIV emphasized that the state shall protect and promote the right of all citizens to quality education at all levels, and shall take appropriate steps to make such education accessible to all, and that the state shall establish, maintain, and support a complete, adequate and integrated system of education 'relevant' to the needs of the people and the society as a whole. To uphold this mandate, education sectors and curriculum developers are focusing on designing a curriculum that will fit to respond the diverse problems and needs of the society. For example, the Republic Act 10533 known as the Enhanced Basic Education Act was designed and implemented to enable Filipino Graduates possess sufficient mastery of basic competencies, become competent to live a meaningful life, socially aware, prepared for the world of work, globally competitive, and legally employable. Specifically, Section Five (V) under curriculum development of the aforementioned law states that curriculum shall be relevant, responsive, and research based purposely to address basic problems of the society. In the tertiary level, the Commission on Higher Education (CHED) releases the minimum stand-

ards and guidelines on the formulation of curriculum of the different institutions it supervised. To ensure that quality and responsive curriculum will be developed, each program should have a CHED Memorandum Order that will serve as basis in the implementation of the program.

Many years ago, researches and curricular reforms are made to improve the formal curriculum which includes the subject competencies, pedagogy of teaching, learning environment, learners and resources. However, less attention was made to the hidden or unplanned curriculum that significantly influences the learner's actual learning and academic resiliency. Hassan (2009) on his study Hidden Curriculum in Higher Education: Linking Theory and Practice states that because of the less attention given to hidden curriculum limited empirical evidences exist that looks at aspects of hidden curriculum, its forms, understandings, and applications underscoring its impact to actual learning and student's success in school. In contrast, various researchers and curriculum experts argued that schools have universalistic and particularistic hidden aspects that enable an unequal environment for the students. Although some of them are visible such as syllabi, school time and exam procedures that might be accepted universalistic, some of them are hidden such as social activities, reward systems, that might be accepted particularistic.

Teachers in various private and public universities and colleges are required to follow and implement the same formal or intended curriculum based on the standard established by the government. However, variability and differences on the delivery and teaching process were evident causing a unique learning experience in these different schools. This variability did not happen accidentally. It is the consequence of the different school factors and practices that occur within the learning institution causing the learner to behave and react differently. As such, considering those different aspects of hidden curriculum might improve students' academic and non-academic performance.

OBJECTIVES OF THE STUDY

This study focuses on the Hidden Curriculum of Private and Public Universities in Bicol Region for the school year 2017-2018. This will answer some issues regarding the assumed differences on the aspects of Hidden Curriculum between Private and Public Universities and Colleges. School Managers, teachers, and other personnel in the different Higher Education Institutions could also consider the results of the study in determining various aspects of hidden curriculum that might influence the student's behavior and student's actual academic success. More specifically, this study will;

1. determine the level of students' participation in Hidden Curriculum along; Extra-curricular activities, satisfaction in School Physical Facilities, and Teaching and Non-teaching Employees working behavior; and
2. test the significant difference between Areas and Aspects of Hidden Curriculum.

The study is anchored on the assumption that hidden curriculum exists in the private and public universities and colleges in the Bicol Region and on the hypothesis that there is significant difference in the students participation in Hidden Curriculum between Areas and among aspects of the Hidden Curriculum. The researchers followed statistical and research standards to test their hypothesis.

METHODOLOGY

This study used descriptive and comparative method of research. Descriptive method was used to determine the level of students' participation in Hidden Curriculum along; Extra-curricular activities, Satisfaction in School Physical Facilities, and Teaching and Non-teaching Employees working Behavior. On the other hand, comparative method was used to determine the significant difference of students' participation in Hidden Curriculum between Areas and its Aspects.

Stratified sampling was used to determine the number of respondents that will be chosen from the selected universities and colleges in the Bicol Region. The respondents of the study were the fourth-year and fifth year students enrolled in the first semester, teachers handling subjects in the tertiary level and non-teaching employees from three (3) private and three (3) private and public universities in Bicol Region. A total of one-hundred (100) fourth year and fifth-year students, one-hundred (100) teachers and one-hundred (100) non-teaching employees will be surveyed and interviewed. The designed will be distributed to the respondents and selected respondents will be asked for an interview.

RESULTS AND DISCUSSIONS

Students' Participation in Hidden Curriculum

The level of students' participation in Hidden Curriculum along their extra-curricular activities, satisfaction in school physical facilities and teaching and non-teaching working behavior were interpreted and categorized according to the following indicators; needs improvement (1.00-1.79), fair (1.80-2.59), satisfactory (2.60-3.39), very satisfactory (3.40-4.19) and Outstanding (4.40-5.00).

Participation in Extra Curricular Activities

Table 1A showed that students' participation in extra-curricular activities has an overall weighted mean of 4.08 (very satisfactory). Specifically, the respondents best described that leadership activities in the university provide opportunities for the students' to develop perseverance and hard work (4.34) which was considered ranked first among the ten parameters with a rating of outstanding. However, it was also found out that the respondents' believed that multi-faith activities in the university should be improved to meet the spiritual needs of the students' general population (3.88). It ranked last among the ten parameters with a very satisfactory rating only.

Table 1a. Participation in Extra Curricular Activities

Parameters	Public Schools			Private Schools			Overall		
	Mean	Rank	Int	Mean	Rank	Int	Mean	Rank	Int
Students are happy when they are engrossed in their sports activities.	4.40	2	O	4.10	2	VS	4.25	2	O
Leadership activities provide opportunities for the students to develop perseverance and hard work.	4.42	1	O	4.26	1	O	4.34	1	O
Students feel inspired while carrying out their socio-cultural activities.	4.18	5	VS	3.95	5	VS	4.06	5	VS
Students perform many worthwhile things in sport.	4.09	9	VS	3.84	9	VS	3.96	9	VS
Cultural activities provide an avenue for the students to develop their talents and skills.	4.36	3	VS	4.08	3	VS	4.22	3	O
Students are enthusiastic about their sports activities.	4.21	4	VS	4.02	4	VS	4.11	4	VS
The opportunity for growth and promotion exists in the student's organization.	4.14	7	VS	3.93	7	VS	4.03	6	VS
Multi-faith activities provide opportunities for spiritual growth and leadership.	4.15	6	VS	3.87	8	VS	4.01	8	VS
Multi-faith faith activities meet the spiritual needs of the members.	4.06	10	VS	3.71	10	VS	3.88	10	VS
The cultural groups foster the value of respect and individual differences.	4.11	8	VS	3.94	6	VS	4.02	7	VS
AVERAGE WM	4.21		VS	3.97		VS	4.08		VS
Interpretation									
Rank	1			2					

These results imply that the respondents' assumed that leadership activities are vital in the development of students' perseverance and hard work and must be one of the thrusts of the university that should be seriously considered. This is also a manifestation that students have an outstanding participation in the different leadership activities and program conducted inside and outside the university. It further implies that the universities and colleges in the Bicol Region have a very good program for the development of leadership skills of the students' through a well-crafted leadership program. They send students to regional, national, and even international conferences aimed in the development of leadership skills of the students. However, it was noted in the result that multi-faith activities should be improved to meet the spiritual needs of the students. This can be associated in the less interest of the students on their spiritual needs which should be considered by the university. Furthermore, the religious diversity in the university causes ambiguity in joining different spiritual activities. This is in the context that every religious group has the leeway to choose and conduct their own spiritual activities that will provide their spiritual and moral needs. This is also an indicator that there are few organizations inside and outside of the university that organizes religious activities which the students can attend to.

Therefore the researchers recommend that university officials particularly those in the student services department should consider these valuable results showing that emphasis should also be given on the various religious activities that will provide the spiritual growth and needs of their students. There should be programs that will promote the importance of developing the spirituality of the students that could shape them become better citizen of the country. Furthermore, finan-

cial allocation for the religious activities should be given to the different religious organizations that are planning to conduct religious activities regardless of its religious affiliation. There should be partnership between the school and other institutions that is intended for the development of spirituality of the students. A regular orientation on the services offered by the multi-faith department of the university is also recommended.

Satisfaction in School Physical Facilities

Table 1B showed that students' satisfaction in schools physical facilities has an overall weighted mean of 3.49 with a very satisfactory rating. The respondents firmly believed that universities and colleges in Bicol Region have large rooms and halls enough for seminars and group sessions with a weighted mean of 3.81. This ranked first among the ten parameters and interpreted with a very satisfactory rating. On the other hand, the respondents are convinced that availability of internet connections in the university should be improved. It garnered a weighted mean of 3.12 with a satisfactory rating. It was ranked last among the ten parameters.

Table 1b. Satisfaction in School Physical Facilities

Parameters	Public Schools			Private Schools			Overall		
	Mean	Rank	Int	Mean	Rank	Int	Mean	Rank	Int
Classrooms and laboratories are adequately lighted and ventilated.	**3.66**	**2**	**VS**	**3.52**	**4**	**VS**	**3.59**	**4**	**VS**
The size and number of classrooms are sufficient to accommodate the student's population.	**3.53**	**5**	**VS**	**3.75**	**3**	**VS**	**3.64**	**3**	**VS**
The classroom is adequately equipped with the furniture, blackboards and with a pleasant atmosphere	**3.55**	**4**	**VS**	**3.47**	**5**	**VS**	**3.51**	**5**	**VS**
Comfort rooms are clean and well kept	**3.38**	**8**	**S**	**3.42**	**9**	**VS**	**3.4**	**8**	**VS**
Laboratories are well equipped with sufficient laboratory equipment and apparatus.	**3.39**	**7**	**S**	**3.46**	**6**	**VS**	**3.43**	**6**	**VS**
Drinking stations are available for the students to use	**3.21**	**9**	**S**	**3.44**	**8**	**VS**	**3.33**	**9**	**S**
Available internet connections	**2.94**	**10**	**S**	**3.31**	**10**	**S**	**3.12**	**10**	**S**
The size of the building is big enough to accommodate the number of students.	**3.57**	**3**	**VS**	**3.92**	**1**	**VS**	**3.75**	**2**	**VS**
There is a comfortable waiting room or student lounge where individuals can stay a while for their teachers.	**3.40**	**6**	**VS**	**3.45**	**7**	**O**	**3.42**	**7**	**VS**
There are large rooms/ halls enough for seminars or group sessions.	**3.75**	**1**	**VS**	**3.86**	**2**	**VS**	**3.81**	**1**	**VS**
AVERAGE WM	**3.43**		**VS**	**3.56**		**VS**	**3.49**		**VS**
Interpretation									
Rank	**2**			**1**					

These results show that universities and colleges in the Bicol Region had given enough emphasis in the construction of function halls and big classrooms to accommodate students and other guests. This becomes possible because of the big amount of budget allocated by the university to construct building and other important school infrastructure which are considered basic requirements in the operation of the university. Furthermore, these universities and colleges apply their academic programs to various accreditations that require each university to have good facilities for students use. One of the considerations is the size of classrooms that could accommodate students' and spacious function halls for students' group works and seminars. Also, these big rooms and function halls are also use for income generating purposes of the university. They accept bookings and rentals of their facilities to be used by external client. However, the respondents both in the private and public universities in the Bicol Region believe that the availability of good internet connections in the university should be improved to cater their academic and personal needs. Information Communication Technology facilities should be upgraded to render excellent internet services for the students and other stakeholder of the university. It was observed that despite the students are required to pay their internet fees, they find it difficult to use the internet services of the school and they believe that the purchase of ICT materials are still lacking. Also, problems on providing good internet services for the students could also be attributed to the lack of excellent services rendered by the different internet service provider.

It is highly recommended that the Information Communication Technology facilities should be improved if possibly at par with the different renowned big universities in the Philippines and by following international standards for ICT. Furthermore, there should be negotiations with the different internet service provider and come up with a possible partnership that could at least improve the internet connection in the university.

Teaching and Non-Teaching Employees Working Behavior

Table 1C showed that Teaching and Non-teaching employees working behavior has an overall weighted mean of 3.97 with a very satisfactory rating. Specifically, it was observed that the teaching and non-teaching employee's demonstrate professionalism at all times which garnered a general weighted mean of 4.05. It ranked first among the ten parameters for the level of working behavior of the teaching and non-teaching employees with a very satisfactory rating. However, it was also noted that the teaching and non-teaching employees find it difficult to convey sense of calm and control at all time with a weighted mean of 3.87 only. It was ranked last among the ten parameters with a very satisfactory rating.

Table 1c. Teaching and Non-Teaching Employees Working Behavior

Parameters	Public Schools			Private Schools			Overall		
	Mean	Rank	Int	Mean	Rank	Int	Mean	Rank	Int
The teaching and non-teaching employees serve with a smile, greet peers and appropriately dressed.	4.01	6	VS	3.90	6	VS	3.95	7	VS
The teaching and non-teaching employees render on-time services.	3.98	7	VS	3.88	7	VS	3.93	9	VS
The teaching and non-teaching employees convey a sense of calm and control at all times.	3.91	8	VS	3.84	9	VS	3.87	10	VS
The teaching and non-teaching employee's foster and model appropriate behavior to students at all times.	4.03	5	VS	3.94	3	VS	3.98	5	VS
The teaching and n0n-teaching employees make the client/students feel important.	4.06	3	VS	3.92	4	VS	3.99	4	VS
The teaching and non-teaching employees are motivated to work regardless of the learning condition or environment.	4.09	2	VS	3.94	3	VS	4.01	3	VS
The teaching and non-teaching employees handle requests, complaints and solution/s to a problem with flexibility.	4.04	4	VS	3.85	8	VS	3.94	8	VS
The teaching and non-teaching employees maintain good rapport and relationship with fellow employees and students.	4.13	1	VS	3.95	2	VS	4.04	2	VS
The teaching and non-teaching employees observe professionalism at all times.	4.09	2	VS	4.02	1	VS	4.05	1	VS
The teaching and non-teaching employees show patience to students with disruptive behaviors.	4.04	4	VS	3.91	5	VS	3.97	6	VS
AVERAGE WM	4.03		VS	3.92		VS	3.97		VS
Interpretation									
Rank	1			2					

These results imply that teaching and non-teaching employees in selected universities in Bicol Region are strictly following the rules and regulations set forth by the civil service commission governing their professional conduct in the workplace. These rules and regulations set the possible sanctions and incentives for the teachers and non-teaching employees. Furthermore, it can also be noted that professional qualifications are always considered first during hiring and promotions of employees. Also, the academic institutions allocate enough budgets for the professional development of the teaching and non-teaching employees making them possible to attend training and seminars that will improve their work as professional employees. But this does not mean that the teaching and non-teaching employees can always demonstrate outstanding personal qualities. It was observed in the results that the teaching and non-teaching employees failed to convey sense of calm and control. This poor conduct of the teachers and non-teaching employees could be attributed to their personal or family problems, heavy workloads with less compensation, pressure in the workplace and even the disrespectful behavior of the students and other clienteles.

The researchers highly recommended that aside from the professional qualifications of the employees, personal qualities should also be tested or considered during hiring. Also, the university officials should plan and conduct annual personality development training and workshop to improve the personal conduct of its employees especially in dealing with students and clients in not so favorable situations in the workplace.

Significant Difference between Areas and Aspects of Hidden Curriculum

Table 1D showed the significant difference between Areas and Aspects of Hidden Curriculum. Between areas, the computed F-value was 3.381 with corresponding p-value of .066 which is greater than 0.05 or 5% level of significance. The test is not significant; therefore it means that there

is no significant difference in the level student's participation in hidden curriculum between private and public universities and colleges in Bicol Region.

Table 1d. Significant Difference between Areas and Aspects of Hidden Curriculum

Source	Sum of Squares	df	Mean Square	F	p-value	Partial Eta Squared
School (Areas)	1.488	1	1.488	3.381	.066	.004
Hidden Curriculum	59.074	2	29.537	67.086	.000**	.130
School*Hidden Curriculum	5.173	2	2.587	5.875	.003*	.013
Error	393.610	894	.440			
Total	13858.180	900				
Corrected Total	459.346	899				

The findings implied that the student's levels of participation in hidden curriculum are the same regardless whether the students are enrolled in a private or public school. Non-differences of student's participation in hidden curriculum between schools are manifestations that both private and public schools are following the basic mandate vital in the operation of the institution. This can be associated to the common standard set by the Commission on Higher Education that governs the implementation of the programs and services of Higher Education Institution across the Region. Ultimately, this shows that HEI's in Bicol Region are aware on their functions, responsibilities, and accountabilities as an academic institution.

This finding was supported by Alimi (2012) in his statement that there is significant difference in facilities available in public and private schools. It however revealed no significant difference in academic and non-academic performance of students in two types of schools. He further added that procurement of more facilities in public secondary schools was made in order to enhance students' academic performance.

Among Aspects of Hidden Curriculum.

Among aspects of hidden curriculum, the computed F-value is 67.086 with a corresponding p-value of .000 which is less than 0.01 or 1% level of significance. The test indicates that the difference among aspects of hidden curriculum is highly significant with a partial eta squared value of .130 or 13 percent.

The results imply that in terms of the aspects of hidden curriculum, significant difference among each other can be observed. It was inferred that students are very participative in the different extra-curricular activities conducted inside and outside the university but on the other hand it can also be observed that students are less satisfied on the physical facilities of the school. This can be associated on the good leadership and organizational programs implemented by the school. However, issues on the availability of internet connections, clean comfort rooms, well ventilated and lighted classrooms, and comfortable student pavilions are still confronting the different schools in the Bicol Region.

The researchers highly recommend that school officials should guarantee the students that they can provide conducive place for learning and could effectively deliver the different services needed by the students and other stakeholders. There should be constant monitoring and evaluation of the delivery processes to ensure that quality services were being rendered by the school personnel. Lastly, open communication between the students and school administration should be practiced to have a regular feed backing on the services delivered by the school.

Interaction between areas and aspects of hidden curriculum

The interaction between areas and aspects of Hidden Curriculum has a computed F-value of 5.875 with a corresponding p-value of .003 which is less than the level of significance of 0.05 or 5%. The test is significant; therefore the variation on the aspects of hidden curriculum was significantly influenced by the type of school with a partial eta squared of .013 or 1.3 percent.

The findings implies that there is significant differences or variations on the behavioral manifestations in hidden curriculum experienced by students enrolled in private and public universities and colleges in Bicol Region. This result can be attributed to the difference of school philosophy, vision, mission, goals, core values, and internal policies that uniquely exist among HEI's in Bicol Region. Furthermore, it shows that schools have a unique shared culture and shared norms that influences the kind of student enrolled on them. Lastly, this could also mean that the schools have different strategies and practices on how they will implement the programs and processes in the institution.

It was supported by Bernal (2005) as cited by Sahan (2014) which states that low income families prefer state schools, while middle and high income families prefer private schools. The socio-economic variety of student sources drastically influences the school and classroom climate. This may be the reason why some parents prefer schools which they believe more prestigious, although elementary and secondary schools have to, by law, follow the same formal curriculum. However, private schools, too, may have different properties as to the elements of the hidden curriculum such as the educational philosophies, features of teachers and other staff, unique environment characteristics, and representation of certain religious and political perspectives. This only indicates that the existing types of hidden curriculum might influence the decision of the parents in the selection of what type of school they will choose for their children.

CONCLUSIONS

Leadership activities are believed to be vital in the development of student's perseverance and hard work. Students have also an outstanding participation in various leadership programs and activities conducted inside and outside the university. Private and Public universities and colleges in the Bicol Region has a very good program for the development of leadership competencies and skills of the students. However, it was noted that multi-faith activities in the university should be improved to develop the interest of the students on their spiritual and moral needs.

The private and public universities and colleges in Bicol Region have big rooms and seminar halls enough to accommodate students and guest for seminars, trainings, workshops and group sessions. Big amount of budget allocation was intended for the construction of buildings to meet the minimum requirement and standards set by the government and other accrediting agencies. On the other hand, internet connections should be improved and must be available for the students and other clientele use.

Teaching and non-teaching employees of selected private and public universities in Bicol Region are strictly following the rules and regulations set forth by the civil service commission governing their professional conduct in the workplace. Professional qualifications are always considered important during hiring and promotions of employees. But, it was observed that the teaching and non-teaching employees failed to convey sense of calm and control in the workplace. This can be attributed to their personal or family problems, heavy workload with less compensation, pressure in the workplace and disrespectful behavior of the students and other clientele.

It was found out in the study that there is no significant difference in the level of student's participation in hidden curriculum between private and public universities and colleges in Bicol Region. This can be associated to the common standard set by the Commission on Higher Education that governs the implementation of the programs and services of Higher Education Institution across Bicol Region. However, significant differences among aspects of hidden curriculum along student's participation in extra-curricular activities, satisfaction in school physical facilities and teaching and non-teaching employees working behavior are observed. Lastly, the variation or differences on the aspects of hidden curriculum was significantly influenced by the type of school where the students are enrolled. This result can be attributed to the difference of school philosophy, vision, mission, goals, and core values, internal and external policies that uniquely exist among Higher Education Institutions' in Bicol Region.

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EXTENT OF IMPLEMENTATION OF OUTCOMES-BASED EDUCATION IN THE COLLEGE OF TEACHER EDUCATION OF OCCIDENTAL MINDORO STATE COLLEGE

Joanne D. Gorospe
College of Teacher Education
Occidental Mindoro State College
Rizal St., San Jose, Occidental Mindoro

ABSTRACT

Outcomes-Based Education (OBE) is now a compulsory approach to education in all the HEIs in the Philippines. This study focused on the ten factors of OBE which are believed to determine the extent of implementation of OBE. Participants of the study were the 100 teacher education students and their 21 teachers at Occidental Mindoro State College. The study used mixed methods in answering the problems of the study. The questionnaire which was modified by Hoffman (1996) based from the previous researches related to the study was used in measuring the extent of implementation of OBE as perceived by the respondents. Interviews were done to address other problems of the study. Results of the study found that both the teachers and the students consider Mission and Student Advancement as the factors of OBE which were implemented to the highest and least extents respectively. The teachers and the students differ on their perceptions on the implementation of OBE in the college especially on the factors of OBE namely, Mission, Curriculum Development, Assessment and Results. When students were grouped according to program, though they belong in one college, it was found that they also differ on their perceptions on the implementation of OBE in the college. They differ on their perceptions on the implementation of the factors namely, Exit Outcomes, Curriculum Development, Instructional Delivery and Assessment. The respondents perceive that teachers' and students' awareness on OBE approach to teaching is one of the problems that the college is facing in the implementation of OBE. In line with this, the respondents suggest awareness campaign on OBE instructional and assessment practices as a solution to address the problem.

Keywords: outcomes-based education, exit outcome, curriculum development, instructional delivery, assessment, teacher education

INTRODUCTION

In the new era of education, reforms had made to establish a method of teaching far from the traditional ones. To meet the standards of internationalization is the primary purpose of institutions in adopting this method. The rebirth of educational structure results to the formation of Outcomes-Based Education (OBE) (Cabaces, et. al., 2014). OBE is a new paradigm in education that is now being pursued in the Philippines. It is a student-centered teaching approach that focuses on developing observable student behavior, thus gearing towards empirically measurable performance called "outcomes" or what the students know, can do and can apply as a consequence of their learning (Dela Cruz & Dela Cruz, 2017).

The main basis of OBE is producing outputs rather than inputs. The learning process is student-centered rather than lecture-based as in the conventional approach. Learning outcomes in the context of OBE are the observable and measurable performance of the students (Kaliannan & Chandran, 2012). In the process of designing program curriculum, the outcome of the learning is emphasized and pre-determined, that is, what is expected from the learning after the students have graduated in order to equip them with the necessary skills and capabilities before they enter the workplace, then going backward with curriculum design, program outcomes and course outcomes,

the development of instructions, delivery modes and appropriate assessment methodologies. Content delivery is done in varied ways to encourage active learning and discover new knowledge in the process of enhancing the understanding of the subject contents (Glowa, 2013).

Outcomes-Based Education (OBE) may be the most exciting and potentially successful curricular innovation for schools, because it requires that a future-driven curriculum focus be developed, and it demands performance assessment (Spady, 1994). However not everyone views OBE as a positive school restructuring strategy. Besides, outcomes-based education is only optional to all educational institutions which create new impact to the students' perspective (Laguador & Dotong, 2014).

Curricula need to be evaluated after each academic year and be validated after each cycle (four years) to ensure that the target outcomes are met. With the shift to OBE, there is a need to start reviewing aspects in line with the curriculum and their implementation (Caguimbal, et al., 2013). Thus, it is expected that the information gathered and presented in this study will assist stakeholders, in curriculum planning and development, resource allocation, assessment and transparency of information. This should lead to a mechanism to enhance study programs on a regular basis to meet the changing requirements of the governing agencies like the Commission on Higher Education.

A study in an Asian University found OBE being implemented in terms of practices and environment. Faculty and students believed that OBE is useful in terms of academics, attitude, and instructions. Basically, a significant relationship between the status of OBE implementation and the level of usefulness of outcomes-based education was found in one of the departments of the state university (Borsoto, et al., 2014).

Memorandum Orders from the Commission on Higher Education mandated the Philippine HEIs to follow a new set of policies, standards, and guidelines for all baccalaureate degree programs that defined the needed competencies for the practice of each field, and a set of program outcomes that the college students in the different fields are expected to possess by the time they graduate. This demands for curricular revisions to meet the desired learning outcomes required in the ever-changing and global standard workforce (Bay & Bernardo, 2013).

Occidental Mindoro State College adopted outcomes-based education for the entire program it offers. In the College of Teacher Education, faculty members were given orientations to equip them with the necessary knowledge and skills in preparation for OBE implementation. Students were also oriented to be aware of the new curriculum. Some courses start with OBE as a topic. They were even required to use OBE references, including OBE workbooks for their field studies. The programs in the college are also preparing for accreditations that require the same approach to education.

In this regard, this study would like to assess the extent of implementation of the said curriculum as perceived by both the teachers and the students. In determining the extent of implementation, the college would find ways to help students to solve their problems in adapting this educational reform. Additionally, this study would lead to development of the framework of OBE design that would greatly help the college to generate globally competitive teacher professionals. Nevertheless, the outcomes of the study will offer a reliable picture of the actual situation regarding the implementation of OBE in the College of Teacher Education. With this, excellent examples of good practice will be found and the overall picture which is worrying can be determined.

OBJECTIVES

Generally, this research paper sought to find out the extent of implementation of Outcomes-Based Education in the College of Teacher Education of Occidental Mindoro State College. Specifically, this aimed to:

1. determine the extent of implementation of Outcomes-Based Education in the College of Teacher Education of Occidental Mindoro State College as perceived by the teachers;
2. identify the extent of implementation of Outcomes-Based Education in the College of Teacher Education of Occidental Mindoro State College as perceived by the students;
3. test if there is significant difference on the teachers' and students' perceptions on the extent of implementation of Outcomes-Based Education in the College of Teacher Education of Occidental Mindoro State College;
4. test if there is significant difference on the students' perceptions on the extent of implementation of Outcomes-Based Education in the College of Teacher Education of Occidental Mindoro State College when they are grouped according to program;

5. identify the problems met by the respondents in the implementation of Outcomes-Based Education; and
6. find out respondents' suggestions in addressing the problems met on the implementation of Outcomes-Based Education.

METHODOLOGY

The study made use of mixed quantitative and qualitative methods of research. The participants of the study were the 100 College of Teacher Education students and the 21 faculty of the college. The student-respondents were chosen through stratified random sampling given the fact that the college has three programs namely, BEEd BSEd and BPE.

In order to gather the needed data, the researcher used questionnaire which was modified by Hoffman (1996) based from the previous researches related to the study. Interviews were also done among the respondents to address questions which could not be answered statistically.

To analyze student-respondents' and teacher-respondents' perceived extent of implementation of Outcomes-Based Education, frequency and mean were used. To investigate the differences on the teachers' and students' perceptions on the extent of implementation of Outcomes-Based Education in the College of Teacher Education of Occidental Mindoro State College, t-test was used. On the other hand, measuring the differences on the perceptions of students on the extent of implementation of Outcomes-Based Education in the College of Teacher Education when they were grouped according to program, ANOVA was utilized. Lastly, to identify the problems met by the respondents in the implementation of Outcomes-Based Education and their suggestions in addressing such, interview was done by the researcher among the respondents and their responses were treated using thematic analysis.

FINDINGS

Extent of Implementation of Outcomes-Based Education as Perceived by the Teachers

OBE focuses on students' achievement of learning outcomes by restructuring the curriculum, delivery and assessments for the achievement of the learning outcomes, unlike content-based learning. The problems faced by Higher Education Institutions in OBE implementation, its impact on students and lecturers, and its effect to education system are some of the issues raised along OBE implementation (Tan, Oriah, & Seniaan, 2012).

Table 1 presents the extent of implementation of Outcomes-Based Education in the College of Teacher Education of Occidental Mindoro State College as perceived by the teachers.

It can be gleaned from the table that Mission is the factor of OBE that has the highest mean of 4.98 and was interpreted as Very High. However, the lowest mean was garnered by Student Advancement with a mean of 4.32. With the overall mean of 4.72, the teachers of the College of Teacher Education in Occidental Mindoro State College believe that Outcomes-based Education is implemented in the college at a Very High extent.

The findings reveal that, as perceived by the teachers, there is a very high extent of implementation of the mission of the school, that is, there is an existing school mission that reflects the staff commitment to learning success for all students. However, as reflected by the results, there is need of system of instructional organization that allows students to advance through the curriculum whenever they can demonstrate successful performance.

Table 1. Extent of implementation of Outcomes-Based Education in the College of Teacher Education of Occidental Mindoro State College as perceived by the teachers.

Factors of OBE	Mean	Description
Mission	4.98	Very High
Exit Outcomes	4.81	Very High
Curriculum Development	4.90	Very High
Instructional Delivery	4.63	Very High
Assessment	4.80	Very High
Student Advancement	4.32	High
Culture	4.65	Very High
Vision	4.74	Very High
Improvement	4.59	Very High
Results	4.77	Very High
Overall Mean	**4.72**	**Very High**

Extent of Implementation of Outcomes-Based Education as Perceived by the Students

Higher educational institutions should be able to monitor the levels of outcomes expected from any academic courses through the propagation of quality teaching by qualified lecturers. These will in-turn result in meaningful learning experiences for the students (Mohayidin, et. al., 2008). With this, students' perception on the extent of implementation of the curriculum must be taken into

consideration given the fact that they are the direct observers of the teaching process.

The extent of implementation of Outcome-Based Education in the College of Teacher Education of Occidental Mindoro State College as perceived by the students is disclosed in Table 2. Out of the ten identified factors of Outcomes-Based Education, Mission got the highest mean of 4.84 and was interpreted as Very High. On the other hand, Student Advancement has the lowest mean of 4.19. With the overall mean of 4.54, the students perceived a very high extent of implementation of OBE in the college.

It can be deduced from the findings that both the teachers and the students have identified Mission as the one which is highly implemented and Students Advancement which is least implemented. This reveals that both groups of respondents believe that the institution is successful in developing a written mission statement that reflect a commitment to the success of the students and had the support of staff. However, there is a need to focus on reporting of learning outcomes to focus on program strengths and weaknesses and student needs.

Table 1. Extent of implementation of Outcomes-Based Education in the College of Teacher Education of Occidental Mindoro State College as perceived by the students.

Factors of OBE	Mean	Description
Mission	4.84	Very High
Exit Outcomes	4.61	Very High
Curriculum Development	4.62	Very High
Instructional Delivery	4.41	Very High
Assessment	4.54	Very High
Student Advancement	4.19	High
Culture	4.40	Very High
Vision	4.68	Very High
Improvement	4.55	Very High
Results	4.54	Very High
Overall Mean	**4.54**	**Very High**

Differences on Teachers' and Students' Perceptions on the Extent of Implementation of Outcomes-Based Education

OBE involves administrators, educators, parents, teachers and students for successful implementation. It is a method of curriculum design and teaching that focuses on what students can actually do after they are taught (Cabaces, et. al, 2014). Thus, it is critical to test where there is significant difference on the perception of teachers and students on OBE implementation.

Relative thereto, Table 3 presents the comparison of teachers' and students' perception on the extent of implementation of OBE. It is found out there is a significant difference on the perceptions of the teachers and the students on the extent of implementation of OBE in the College of Teacher Education. The p-value of 0.14 means that there is variability in the perceptions of the two groups of respondents.

Considering the ten factors of OBE, the teachers and the students have significant differences on their perceptions on the implementation of Mission (p=.020), Curriculum Development (p=.002), Assessment (p=.014), and Results (p=.018).

The findings indicate that the two groups of respondents vary on their perceptions on mission statement of the institution, on the implementation of the articulated framework of program and its alignment with the exit outcomes, on the alignment of the assessment with the course outcomes, and on the observed improvements in the schooling process.

On the contrary, Caguimbal, et al. (2013) found in their study that a clearly defined assessment standards and where in both teachers and students are knowledgeable on how assessment are utilized are ultimate gains of outcomes-based education. Additionally, Harden (2007) pointed out that the curricular objectives for the OBE are presented in detail. Thus, the planning process and implementation is somewhat complicated and hard to manage both by the teachers and the students.

Table 3. t-test analysis comparing teachers and students' perception the extent of implementation of Outcome-Based Education in the College of Teacher Education of Occidental Mindoro State College.

Factors of OBE	F	t-value	p-value	Interpretation
Mission	27.213	2.365	.020*	Significant
Exit Outcomes	3.157	1.948	.054	Not Significant
Curriculum Development	10.129	3.167	.002*	Significant
Instructional Delivery	.004	1.820	.071	Not Significant
Assessment	6.075	2.493	.014*	Significant
Student Advancement	1.186	.874	.384	Not Significant
Culture	11.817	1.846	.067	Not Significant
Vision	.445	.568	.571	Not Significant
Improvement	.220	.289	.773	Not Significant
Results	1.301	2.392	.018*	Significant
Extent of Implementation of OBE	1.603	2.506	.014*	**Significant**

Differences on Students' Perceptions on the Extent of Implementation of Outcomes-Based Education When They are Grouped According to Program

The most pragmatic approach in education evaluation is to focus on students' perspectives of their experience with a learning program. Feedback from the students is essential to the creation of a learning environment (Aziz, Yusof & Yatim, 2012). With this, students' perceptions on the implementation of OBE when they are grouped according to programs is presented in Table 4.

When students are grouped according to the program they belong, it was found that with the p-value of .011, students from BEEd, BSEd and BPE programs differ on their perceptions on the implementation of OBE in the College of Teacher Education. The groups of students vary on their perceptions on the implementation of the factors of OBE namely, Exit Outcomes (p=.020), Curriculum Development (p=.016), Instructional Delivery (p=.048) and Assessment (p=.011).

The findings imply that the groups of students have varied perceptions on the implementation of student learners goals that reflect the knowledge and skills needed to be successful in adult life. They also vary on their perceptions on the implementation of alignment of unit outcomes with the exit outcomes, on the process of demonstration of authentic curriculum and on the implementation of authentic assessment aligned with outcomes requiring high performance standards.

Table 4. F-test analysis comparing students' perceptions on the extent of implementation of Outcome-Based Education in the College of Teacher Education of Occidental Mindoro State College when they are grouped according to program

Factors of OBE	F	p-value	Interpretation
Mission	2.230	.113	Not Significant
Exit Outcomes	4.066	.020*	Significant
Curriculum Development	4.299	.016*	Significant
Instructional Delivery	3.125	.048*	Significant
Assessment	4.753	.011*	Significant
Student Advancement	1.854	.162	Not Significant
Culture	2.051	.134	Not Significant
Vision	1.947	.148	Not Significant
Improvement	2.468	.090	Not Significant
Results	2.252	.111	Not Significant
Extent of Implementation of OBE	**4.752**	**.011***	**Significant**

Problems Met By the Respondents in the Implementation of Outcomes-Based Education

In order to gather data on the problems met in the implementation of OBE as experienced by the respondents, an open-ended question was integrated in the research instrument. However, some of the respondents hesitated to answer that part, thus, interview among the respondents was also done.

Based on the respondents' answers on the instruments and on their answers in the interviews, their answers were treated using thematic analysis. Their responses can be summarized in Table 5.

Table 5 presents the thematized responses of the respondents. Though most of the respondents said that they have not encountered any problem in the implementation of OBE in the College of Teacher Education, some of them responded and it can be gleaned from the table that 21 or 17.36% of the respondents said that the problem in the implementation of OBE in the college is the awareness of both the teachers and the students on OBE approach to teaching.

One of the student-respondents said, "One of the problems met in the implementation of OBE is the lack of knowledge regarding the program". One of them even said that "Some of the teachers are not aware what OBE is, especially the part-time teachers."

On the other hand, only three (3) of the respondents said that problem on the implementation of OBE may be linked to the nature of the subjects. One of the teacher-respondents said that "There are, at times, difficulties in aligning the OBE thrust to the nature of the subject."

Table 5. Problems met by the respondents in the implementation of Outcomes-Based Education

The me	Problems Met in the Implementation of OBE	Number of Interviewees Who Cited The Reason	Percentage of Interviewees Who Cited The Reason
1	Teachers' and students' awareness of the OBE approach to teaching	21	17.36%
2	Teacher factors (too high expectations, forms of assessment given and reporting of assessment results and communicating learning outcomes)	10	8.26%
3	Student factors (inability of students to meet attain learning outcomes because of learning difficulties)	7	5.79%
4	Lack of instructional materials (i.e. OBE-compliant reference materials)	13	10.74%
5	Nature of the course/subject matter	3	2.48%

The finding is supported by the study of Rajaee, et.al (2013) which states that main problem with implementation of outcome based education is the broad definition of outcome based education itself. While it emphasizes the achievement of outcomes, this also refers to the achievement of learning outcomes for a particular course. The normal operation for an academic programmer is to further map the courses learning outcome to the program outcome in order to observe the accumulative sum of learning outcome contributing to the achievement of program outcome.

Respondents' Suggestions in Addressing the Problems Met in the Implementation of Outcomes -Based Education

Respondents who have identified problems in the implementation of OBE in the College of Teacher Education were asked by the researcher on the suggestion that they could give to address the given problem.

Table 6 presents the thematized answers of the respondents. Most of them (20 or 16.53%) said that there should be an awareness campaign on OBE instructional and assessment practices.

One of the teacher-respondents answered, "Awareness campaign can be done to allow all faculty to keep up with the changes in our curriculum, particularly in instruction and assessment practices." Some student-respondents mentioned, "The school may have or conduct several seminars on OBE", "CTE should be informed that the grading standard is based on OBE" and "The school must disseminate the information to all teachers so that they can be aware of the implementation of OBE".

Table 6. Respondents' suggestions in addressing the problems met in the implementation of Outcomes-Based Education.

Theme	Suggestions in Addressing the Problems Met in the Implementation of OBE	Number of Interviewees Who Suggested the Solution	Percentage of Interviewees Who Suggested the Solution
1	Awareness campaign on OBE instructional and assessment practices	20	16.53%
2	Knowing students' abilities and utilization of OBE teaching strategies	10	8.26%
3	Matching teaching styles or strategies with students' abilities for the realization of learning outcomes	5	4.13%
4	Administration support on the procurement of OBE-Based books and other instructional materials that will support in the implementation of OBE	13	10.74%

This corroborates with the recommendation of Borsoto, et. al. (2014) in their study on "Status of Implementation and Usefulness of Outcomes-Based Education in the Engineering Department of an Asian University" which states that the college should have a continuous and sustainable monitoring of the implementation of OBE through the use of data base system. The college should also improve the monitoring system of the implementation of OBE through seminars and additional assessment examination.

CONCLUSION

Based on the findings, the following conclusions were derived:

1. The extent of implementation of Outcomes-Based Education in the College of Teacher Education of Occidental Mindoro State College as perceived by the teachers is very high.
2. The extent of implementation of Outcomes-Based Education in the College of Teacher Education of Occidental Mindoro State College as perceived by the students is very high.
3. There is significant difference on the teachers' and students' perceptions on the extent of implementation of Outcomes-Based Education on the factors of OBE namely, Mission, Curriculum Development, Assessment and Results.
4. When grouped according to program, there is significant difference on the students' perceptions on the extent of implementation of Outcomes-Based Education in terms of Exit Outcomes, Curriculum Development, Instructional Delivery and Assessment.
5. The respondents believe that teachers' and students' awareness of OBE approach to teaching is one of the problems met by the college in OBE implementation.
6. The respondents suggest awareness campaign on OBE instructional and assessment practices in addressing the problems met in the implementation of Outcomes-Based Education.

RECOMMENDATION

The discussion above leads to the following recommendations:

1. The College of Teacher Education must focus on strengthening factors of OBE such as in-

structional delivery, assessment and students advancement.

2. In their approach to teaching, teachers from the different programs of the college should use the same OBE standards, and the same standards should be relayed and communicated among the part-time faculty of the college.
3. School administrators should fully support faculty professional development in trainings and seminars on the updates of the OBE and processes such curriculum mapping and syllabus preparation.
4. A study which will focus on the awareness or status and impact of the implementation and adoption of an outcomes-based approach that would include the views, insights and experiences of the faculty, administrators/managers and other personnel is suggested.

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DEVELOPMENT OF A 300A TOROIDAL CORE ARC WELDING MACHINE

Engr. Kenneth G. Occeño, Ed. D.
Engr. Wennie F. Legario, Ed.D.
Engr. Rolly D. Degala
Engr. Rolando R. Francisco
Engr. Ibarra A. Bisnar Jr.
Engr. Josue A. Ajera
John Anthony F. Faeldonea
Raymund C. Charlon
Capiz State University-Main Campus
Roxas City, Capiz, Philippines

ABSTRACT

The excessive electrical power consumption of the Conventional AC Arc Welding Machine violates the Energy Efficiency and Conservation Act of 2017. This also contributes to the headache of the welding industry where cost of welding works are affected because of too much electricity consumed by the aforementioned machine. To address this problem, the researcher developed a 300A Toroidal Core Arc Welding Machine. This study seek to find out the power consumption of the Toroidal Core Arc Welding Machine (Experimental Group) compared to the Conventional AC Arc Welding Machine (Control Group) at no load and full load condition with the same welding output and to determine the minimum thickness of GI sheet that can be weld. This study was conducted at Capiz State University, Main Campus Roxas City, Capiz, Philippines. The method used in this research study was experimental method using the mean and actual testing of the machine in analyzing the data. The Experiment Group was tested in five trials for each different current settings. The same procedure was conducted to the Control Group to compare their power consumption. Data gathered were tabulated for analysis and interpretation. After analyzing the data, the result revealed that at no load condition the Control Group consumed more electrical power compared to the Experimental Group. The study also revealed that at full load condition the Control Group consumed more power compared to the Experimental Group. This study concludes that the 300A Toroidal Core Arc Welding Machine is more economical compare to Conventional AC Arc Welding Machine in terms of power consumption as well as to weld the thin GI sheets. It is recommended to follow the procedure of operation of the developed welding machine for better welding output performance.

Keywords: Toroidal core, welding machine, power consumption, economical, experimental method, full load, Roxas City

INTRODUCTION

Background of the Study

It has been reported that annual electricity consumption of welding industry is $15 million in the US and $99 million globally according to Lincoln Electric Company (2018). Several researchers have focused their work to study the economic aspect of metal arc welding process. In addition welding operators is a costly process because it involves several types of resources. Energy conservation has become one of the priorities in manufacturing industries, while the energy efficiency at process level may provide deep understanding of the energy consumption during the manufacturing process. In relation to this the Senate Bill No. 1531 Energy Efficiency and Conservation Act of 2017 filed on July 31, 2017 by senator Legarda, Loren B., Binay, Maria Lourdes Nancy S., Trillanes, Antonio "Sonny" F., Gatchalian, Sherwin T. to the Philippines 17th Congress to address this problem. The technology of welding is becoming ever more complex. Welding technology is continuously growing to meet society's needs, but

industry is changing rapidly. Welding industry commonly use conventional type welding machines which are very expensive in terms of electric energy consumption. The conventional welding machines draw high current especially during idle mode. It draws currents that can contribute high energy consumption. In line with this assessment, the researcher developed a new technology which is a toroidal transformer type arc welding machine that is more efficient in continuous operating performance, with less power consumption, with temperature stability and resistivity for more continuous duty welding process.

Toroidal Transformer type welding machine is ideal to meet the needs of the industry. A low electric power consumption is highly considered when using a toroid welding machine. This toroidal welding machine is using toroidal type iron core wherein the primary and secondary windings were wound axially and equally distributed to the entire iron core.

The researchers assured quality outputs as well as a lower current consumption since it doesn't need to have a power transformer to operate. A unique feature of this product is, based on a donut-type core base of med 1980's when Michael Faraday's first invention of the transformer; it is also more economical in terms of power consumption because it will not consume current while circuit is closed.

The results of this research could help users or technician to save money and further help the country.

OBJECTIVES OF THE STUDY

The study aimed to develop a 300A Toroidal Core Arc Welding Machine with a core design made of toroidal core using silicon plain sheet materials which is economical in power consumption. Specifically, it sought to:

1) Determine the power consumption of the developed Toroidal Core Arc Welding Machine compared to the Conventional AC arc welding machine at no load and full load condition;
2) 2) Determine the full welding performance of the Toroidal Core Arc Welding Machine as compared to Conventional AC arc Welding Machine in terms of minimum thickness that can be weld.

METHODOLOGY

This research study used the experimental method using numerous number of settings and number of trials per settings to determine the power consumption of the Toroidal Core Arc Welding Machine as the Experimental Group. The method involves collection of data, application of statistical tools, data analysis and actual test of the device's welding performance. The description of the Experimental Group is a toroidal core type welding machine wherein the primary and secondary windings were wound axially and equally distributed to the entire iron core. The device is unique in terms of core design it is made of toroidal core using a silicon plain sheet materials. This machine has a safety device and switch controller that selects different settings of welding adjustment. The Experimental Group introduce new core design and has a capacity to weld a minimum thickness of 0.3mm GI metal sheet. The materials and tools used in designing the device are Fish paper, TW #10/7 AWG, Cambric tube, TW #12/7, Selector switch, Knife switch, #4 AWG copper wire, Silicon iron sheet, Electrical Red Varnish, Pilot lamp, #10 AWG magnetic wire, cotton tape and electrical tape. For the design procedure, the researcher's gather all the materials and tools needed, make layout of the toroidal frame, and calculate the number of turns per volt of the toroidal core, rewind the primary and secondary windings followed by isolation test. Lastly, the desired drying of the electrical burnish in the coil. After baking the coil, attach the welding electrodes to the electrode holder for ready to test the product performance. The Experimental Group were tested in five different settings with five number of trials per setting to determine the input current and power consumption in no load and full load condition. The same procedure were applied to the Control Group and compared the power consumption by the two welding machines. The Experiment Group were also tested the minimum thickness of GI sheet that can be weld. In determining the power consumed by the machines for five settings in five trials per settings mean was used.

Block Diagram:

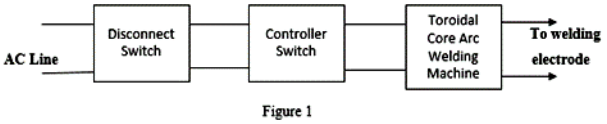

Figure 1

Diagram:

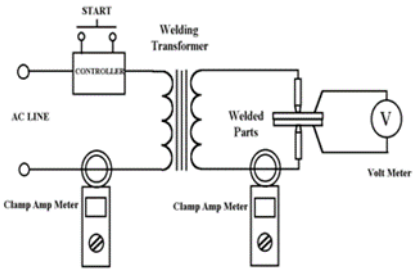

Figure 2

The diagram in figure 2 shows on how to measure the input current, output voltage and power consumption in watts by the Experimental Group in one setting of welding selector with five number of trials per setting. The Experimental Group has five number of settings.

The following are the measuring apparatuses that were used to measure on regulate physical quantity/process variables such as Clamp Amp meter, voltmeter and wattmeter to measure the input current and power consumption of the Experimental Group and Control Group. The factors that affect the effectiveness of this study is the device sufficiency to produce enough input current.

The data gathered are the input current in amperes and power consumption in watts of the Experimental Group and Control Group for comparison. Statistical tools utilization in the analysis of the data were the mean. The formula $P_i = P_e \times I_i \times$ p.f can be used also to determine the power in watts of the welding machines.

For mean:

$$x=(\sum x)/n$$

Where x is the arithmetic mean, $\sum x$ is the Sum of the score, and n is the no. of trials

For the power consumption of value

$$P_i = P_e \times I_i \times p.f$$

Where:

P_i = power input
P_e = voltage input
I_i = current input
p.f = power factor

FINDINGS

Analysis, Presentation and Interpretation of Data

1. The power consumption of the toroidal core arc welding machine compared to the commercial AC arc welding machine at no load and full load condition.

Table 1-a indicates that the power consumed of Experimental Group in setting no.1 were 220.8 watts, for setting no.2 consumed 257.6 watts, for setting no. 3 consumed 294.4 watts, while setting no. 4 consumed 349.6 watts, and setting no. 5 consumed 441.6 watts. While for Control Group revealed that setting no. 1 consumed 920 watts, setting no. 2 consumed 956.8 watts, setting no. 3 consumed 1067.2 watts and setting no. 5 consumed 1122.4 watts. This shows that the power consumption of Experimental Group is lesser compare to the Control Group in 5 different settings using 5 trials of test per setting.

This implies that the Experimental Group is more economical in terms of power consumption than to the Control Group in no load condition.

Table 1-a. The power consumed of the toroidal core arc welding machine compared to commercial arc welding machine in 5 settings with 5 trials per settings at no load condition.

Table 1-a. The power consumed of the toroidal core arc welding machine compared to commercial arc welding machine in 5 settings with 5 trials per settings at no load condition.

Settings Number	Number of Trials					Current Input (Ampere)	Power Consumed	Type of Welding Machine
	1	2	3	4	5			
1	220.8	220.8	220.8	220.8	220.8	1.2	220.8	Experimental Group
	920	920	920	920	920	5	920	Control Group
2	257.6	257.6	257.6	257.6	257.6	1.4	257.6	Experimental Group
	956.8	956.8	956.8	956.8	956.8	5.2	956.8	Control Group
3	294.4	294.4	294.4	294.4	294.4	1.6	294.4	Experimental Group
	1067.2	1067.2	1067.2	1067.2	1067.2	5.8	1067.2	Control Group
4	349.6	349.6	349.6	349.6	349.6	1.9	349.6	Experimental Group
	1122.4	1122.4	1122.4	1122.4	1122.4	6.1	1122.4	Control Group
5	441.6	441.6	441.6	441.6	441.6	2.4	441.6	Experimental Group
	1324.8	1324.8	1324.8	1324.8	1324.8	7.2	1324.8	Control Group

In table 1-b indicates that the power consumed by Experimental Group for setting no.1 were 3385.6 watts, for setting no.2 it consumed 4095.84 watts, for setting no. 3 it consumed 4489.6 watts, for setting no. 4 consumed 5214.56 watts, and setting no. 5 consumed 8059.2 watts. While the power consumed by Control Group indicates that setting no. 1 were 3680 watts, setting no. 2 were 4703.04 watts, setting no. 3 were 6285.44 watts, setting no. 4 consumed 7853.12 watts, and setting no. 5 consumed 11422.72 watts. This shows that the power consumption of Experimental Group is lesser compare to the Control Group in 5 different settings using 5 trials of test. This result is related to the study of Wei Li, et al. (2004) that it can be found that the energy efficiency of AC welding is about 26%, which means only 26% of the total energy is used to heat the

metal and over 75% of the total electrical energy is wasted on the welding machine itself.

This implies that the Experimental Group is more economical in terms of power consumption than to the Control Group in full load condition.

Table 1-b. The power consumed of the toroidal core arc welding machine compared to commercial arc welding machine in 5 settings with 5 trials per settings at full load condition

Table 1-b. The power consumed of the toroidal core arc welding machine compared to commercial arc welding machine in 5 settings with 5 trials per settings at full load condition.

Settings Number	Number of Trials					Current Input (Ampere)	Power Consumed	Type of Welding Machine
	1	2	3	4	5			
1	3680	3312	2576	3864	3496	18.4	3385.6	Experimental Group
	3680	3496	3680	4048	3496	20	3680	Control Group
2	4103.2	4232	4048	3826	4132.64	22.15	4095.84	Experimental Group
	4416	4784	5023.2	4416	5152	25.56	4703.04	Control Group
3	4416	4600	4416	4232	4784	24.4	4489.6	Experimental Group
	5722.4	7065.6	5704	6992	32588	34.16	6285.44	Control Group
4	5336	4968	5188.8	5704	4876	28.34	5214.56	Experimental Group
	6992	415.2	7176	8684.8	8868.8	42.68	7853.12	Control Group
5	9200	6992	7360	7728	9016	43.8	8059.2	Experimental Group
	11040	11853.2	10304	12180.8	11776	62.08	11422.72	Control Group

2. The full welding performance of the toroidal core welding machine as compared to commercial AC arc welding machine in terms of minimum thickness that can be weld.

Table 2 shows the thickness of GI sheet that can be weld by the Experimental Group and the Control Group. The performance of two welding machines was tested and recorded according to its actual results of welding output. Results indicates that the minimum thickness that can be weld by the Experimental Group is 0.3mm and the Control Group can weld only a minimum thickness of 5mm. It shows that the Experimental Group can weld the thin GI sheets. This is related to the study of Nuri Akkas, et al. (2013) that the minimum arc current and the maximum arc voltage correspond to the minimum welding thickness.

This implies that the toroidal core arc welding machine has better performance compare to conventional AC arc welding machine in terms of minimum thickness of GI sheet that can be weld.

Table 2. Performance of the toroidal core welding machine and the commercial welding machine in terms of minimum thickness that can be weld.

Table 2. Performance of the toroidal core welding machine and the commercial welding machine in terms of minimum thickness that can be weld.

MINIMUM THICKNESS THAT CAN BE WELD		
THICKNESS	TOROIDAL CORE ARC WELDING MACHINE (Experimental Group)	COMMERCIAL AC ARC WELDING MACHINE (Control Group)
.3mm	√	x
.5mm	√	x
.8mm	√	x
.9mm	√	x
1mm	√	x
3mm	√	x
5mm	√	√
8mm	√	√
9mm	√	√
10mm	√	√
12mm	√	√

Legend: √ -------- can be weld
X ------- cannot be weld

CONCLUSIONS

Based on the findings after the statistical analysis from the data gathered the following conclusions were drawn:

1. The power consumption of Toroidal Core Arc Welding Machine (Experimental Group) is lesser compare to the Conventional AC Arc Welding Machine (Control Group) in five different settings with five trials per settings. It concludes that the Experimental Group is more economical in terms of power consumption than to the Control Group in no load and full load condition.
2. The Toroidal Core Arc Welding Machine (Experimental Group) can weld the minimum thickness of GI sheets compared to Conventional AC Arc Welding Machine (Control Group) with the same welding output performance.

RECOMMENDATIONS

The following recommendations were made by the researchers based on the performance of the product:

1. The researchers highly recommend solid copper rod for the resistance spot welding for more economical purposes.
2. The researchers is highly recommend to select appropriate settings of the Toroidal Core Arc Welding Machine to weld thin thickness of G.I sheet. It is also recommended to follow the procedure of operation of the machine for better and improve welding performance.

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THE CULTURAL TOURISM IN THE PHILIPPINES: A PROBLEM-BASED LEARNING

Leigh Anne A. Mijares[1] and Clare Maristela V. Galon[2]
[1]Department of Tourism Management, College of Arts and Sciences, Cebu Normal University
[2]Department of Chemistry and Physics, College of Arts and Sciences, Cebu Normal University
Osmena Blvd., Cebu City, Cebu, Philippines

ABSTRACT

Philippines, despite having an increasing tourists' arrival every year, has some tourism and hospitality workers that disregard the inimitable culture of Filipinos which may lead to dishonesty. Thus, attitudes of these stakeholders' visit to the Philippines vary. In this paper, quantitative analysis is used in determining the cultural tourism defects that have persisted and ceased from 2011-2016 and finding simulated solutions to the problem of cultural tourism. The result shows an exponential fit trend which suggests that the Koreans' arrival in the Philippines from 2011 to 2016 is increasing positively even though the number of negative impressions is also increasing. However, sudden downfall dependence can also be observed which may occur through time that may affect their future arrivals in the country. The decrease in the cultural tourism in the Philippines suggests that the country focuses on the tangible aspects of tourism industry and is after the boosting of business particularly on money related things wherein the country's distinctive culture and tradition have been neglected. Furthermore, there is no profound development on the country's facilities that could give contentment to the arriving tourists. It is recommended that the service providers should have measures to follow in rendering service and the government should develop the country's infrastructures and uphold the upright Filipino culture.

Keywords: Cultural Tourism, Tourists, Hospitality Workers, Culture, Philippines

INTRODUCTION

Culture can give people a connection to certain social values, beliefs, religions and customs. According to Madrelina de la Cerna (2015), *"We have a culture and a proud history which need to be taken care of as time progresses";* hence, one factor why tourists, especially international types are coming into the Philippines is because of our unique and excellent culture which is being hospitable and caring individuals. According to DOT Secretary Wanda Teo, there are 3,357,591 foreigners who visited the Philippines from January to June 2017, higher by about 390,000 than 2016's 2,978, 438 arrivals (web.tourism.gov.ph/news_features/tourist_arrivals.aspx, retrieved June 21, 2018). This shows that Philippines is reflected to be growing in terms of tourism and hospitality industry.

As noted by Eshliki and Kaboudi (2012), community attitudes are crucial for successful and sustainable tourism development because an understanding of community's attitudes and perceptions, and how these perceptions are formed regarding tourism development would be valuable knowledge for decision makers. The tourism industry is one of the biggest industries today which greatly aid the economy of a place. Muganda et al (2003) noted that the interaction between local communities and tourism development is one of the core elements for developing a viable industry in a destination.

However, in spite of having an upward result of tourists' arrival every year, some tourism and hospitality workers disregard the culture and color of Filipinos which sometimes lead them to dishonesty, this statement was shown in the DOT statistic report related to the most dislikes of the tourists about Filipino from the year 2011-2016 (http://www.tourism.gov.ph/#, retrieved June 21, 2018). With these, some tourists can have negative and discreditable pictures of the Philippines. Knowing that tourism industry is one of the major contributors of our country's income, unemployment of Filipinos working in the industry might transpire if this will continuously happen. Like-

wise, it will possibly institute unpleasant camaraderie with the other countries as well.

In this paper, the goal is to simulate the future arrivals of Koreans in the country. Specifically, we aim to determine the cultural tourism defects that have persisted and ceased from 2011 to 2016 and understand how these can affect the number of Korean tourists that will be coming in the Philippines. There is a need to study the things dislike most of the tourists about the Philippines in order to help our law making body and top management level of tourism industry to strongly implement the necessary laws for the benefit of the tourists, tourism workers, hospitality industry and Philippines as a whole. Likewise, this will further help the DOT to market the Philippines easier and to have reputable name in tourism industry. This study will also help the researchers to know the perceived impacts on the tourism and hospitality workers and even country's facilities such as roads, airport, etc., thus, recommendations will be given on how to maintain or balance the possible effects to tourism. Lastly, this will sustain our local characteristics and strong vitality which are considered to be fountains of cultural tourism.

REVIEW OF RELATED LITERATURE

Matarrita-Cascante (2009) stated that tourism is a catalyst for change, which creates a series of impacts specially to host communities. This statement implied that tourists' arrival in the country brought changes to the community both negative and positive aspects, likewise there is a culture exchange because of the presence of the people from different walk of life. With this, the Filipino service providers somewhat cast-off our culture to delight more the tourists coming in the country. Therefore, there is a tendency that once there are tourists, then the service providers may have different treatment between international and local tourists. They treat more foreign tourists and would ask for high payment from them, knowing that these tourists coming in to the Philippines have less knowledge of fare, food and etc. unlike locals.

Every tourism industry embraces a diverse personality, attitude and identifies circumstances in different ways; hence there is no way to define to what extent tourist distinguish risk (Pearce, 2007). Thus, there are things both undesirable and constructive matters that the tourists contribute to the workers; positive in a way that the service providers can deliver quality service to them. Likewise, they know how to compete globally because there are diverse tourists coming into the country. On the other hand, there is also negative contribution, particularly if the tourists are not satisfied with the infrastructures and other factors that the Philippines has. Hence, Pearce (2007) statement was in accordance to what Matarrita-Cascante (2009) has stated.

Moreover, Georg Simmel Center (GSZ) Metropolitan Studies (2017) said, tourism industry is making a much greater name in the city life from previous years. This is not to boast oneself in terms of continuous growing numbers of visiting tourists' attractions and cultural or traditional destinations, but also in the increasing new form on intensive tourism falls into renovated residential areas or in line with neighboring town centers that was not touched by the previous tourism. Tourism sector is continuously growing, creating a positive impact, and providing benefits on both income and job creation. With this, the Filipino service workers must give more importance to service and sometimes became sub-servient to the tourists because of the benefits they can get. Hence, multiplier effects will come in, this means that when one tourist pay for a thing that he/she purchases, then that money will go to the workers then the workers will transfer it to his/her family.

The theory of Tsyganok (2013) states that accommodation and airports are very important part of the tourism infrastructure and the development of tourism is a function of these. It creates a home away from home for the tourist. This implied that infrastructures of a certain country are one of the major reasons of the guests' satisfaction. This is the first mark that the tourists observe when he/she arrived in a place. The main objective of home-stay program is to offer accommodation to the tourists and discover the local, cultural and natural lifestyle (Jabil et. Al, 2011). In this theory, the organizations' responsibility should double their efforts in implementing rules that can help maintain the orderliness and even resolve our infrastructures' glitches in order to sustain and possibly increase the tourists' arrival in the country. After all, tourism industry is one of the contributors of the Philippines' economic status.

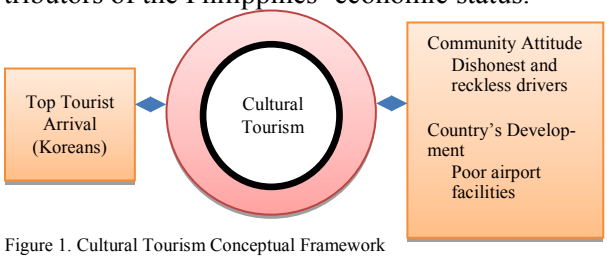

Figure 1. Cultural Tourism Conceptual Framework

This study is anchored on cultural tourism theory. Tourism helps to protect our nation's natural and cultural treasures and improve the quality of life for residents and visitors if cultural tourism development has proper planning [Ismail (2014)]. These variables, the top tourists' arrival who are Koreans and the community's attitude and country's development are interconnected with each other in developing a healthier and better cultural tourism in the Philippines.

According to Department of Tourism Statistical Record, the top tourists arriving in the Philippines, from 2011 to 2016, are the Koreans. They are the main variable that the researchers' wanted to study. Second, this paper will look at the current tourism facilities and status of the Philippines such as the airports, roads, etc. in order to contribute to the country's development. These things are the support system of tourism industry and can affect the operations and the satisfaction of our tourists, both local and international. Next, analyze the community attitude. This factor refers to the attitude of the community in terms of perception, knowledge and involvement. There should be involvement between the local community to the Local Government Unit (LGU), Non-Government Organization (NGO), DOT, tourists and tour guides. Muganda et al (2003) noted that the interaction between local communities and tourism development is one of the core elements for developing a viable industry in a destination. According to Godfrey and Clarke (2000, as cited by Muhanna, 2007), communities form a basic element in modern tourism as they are the focal point for the supply of accommodation, catering, information, transport facilities and services.

As noted by Eshliki and Kaboudi (2012), community attitudes are crucial for successful and sustainable tourism development because an understanding of community 's attitudes and perceptions and how these perceptions are formed regarding tourism development would be valuable knowledge for decision makers.

METHODOLOGY

The researchers used the quantitative survey method, a structured way of collecting and analyzing data obtained from different sources (https://www.sisinternational.com/what-is-quantitative-research/, retrieved June 21, 2018). The variables used are Korean tourists since they are the top arriving tourists in the Philippines from 2011-2016 and the dislikes that most of the tourists feel about the Philippines. Data were retrieved from DOT Philippines Statistics Office from 2011. This is finding answers to the problem of this study. It utilized descriptive approach of data analysis and presentation. This design was used because it provides a clear and evident presentation of the cultural tourism of the Philippines. The researchers used the Eureqa application, which is freely down-loadable software, to make the result faster and better for the analysis of the paper.

RESULTS and DISCUSSIONS

Koreans always rank first among the visitor arrivals to the Philippines by country of residence from 2011 to 2016 based on the data gathered from Tourism Research and Statistics Division, Office of Tourism Development Planning, Planning, Product Development and Coordination, Department of Tourism, Republic of the Philippines, thus their contribution towards the development of our country's cultural tourism and hospitality industries is being analyzed.

Table 1. Data on Effects to Cultural Tourism

Disliked in Philippines		Koreans arriving in the Philippines (2011-2016)
Dishonest or reckless driver (%)	Poor airport facilities (%)	
1.8	3.0	92,249
0.9	5.1	102,166
1.8	4.9	134,994
2.4	8.8	118,308
2.4	4.5	147,163
3.3	2.9	147,165

Data retrieved from: Department of Tourism, Republic of the Philippines

At 50.3 % convergence,

$$y = 1.18e^{5x_1} + 7.47e^{4x_2} - 2.19e^{5} - 1.03e^{4x_1x_2} - 4.27e^{3(x_2)^2} - 9.76e^{3(x_2)^2}$$

Where
x_1 = dishonest or reckless driver
x_2 = poor airport facilities

Table 2. Result of the regression analysis

R^2 goodness of fit	1.00
Correlation coefficient	1.00
Maximum error	0.24
Mean Squared Error	0.03
Mean Absolute Error	0.13
Coefficients	6.00
Complexity	27.0
Primary Objective	0.13
Fit (Normalized Primary Objective)	6.64 e^{-6}

The statistics (2011-2016) of the yearly population of Koreans visiting the Philippines and the

two frequently occurring things that they disliked about the Philippines within the years covered are shown in Table 1. At 50.3 percent convergence of the regression analysis, the data shows an exponential fit trend (See equation 1). The results suggest a strong correlation between the model's predictions and its actual results, and the model is accurate with R2 equal to 1. The behavior of Koreans is dependent on the cultural tourism that the Filipinos can offer. Their arrival in the Philippines is increasing positively even though the number of negative impressions is also increasing. However, sudden downfall dependence can also be observed which may occur through time. This occurrence happens if dishonesty or reckless driver and poor airport facilities will continuously increase. This decrease will greatly affect the international tourism of the Philippines, in general and this will lower the population of Koreans coming to the Philippines, more specifically. In the graph, we can also observe that a constant behavior can happen, which means that the things disliked most about the Philippines will not affect the Korean-Filipino relationships. One good reason is that these individuals are already used to that incidents and their decisions in visiting the Philippines will no longer be affected by these negative practices.

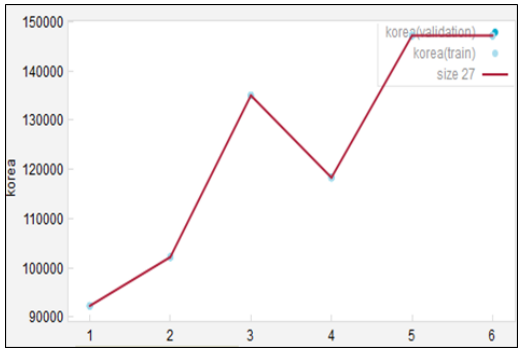

Figure 2. Solution Fit Plot

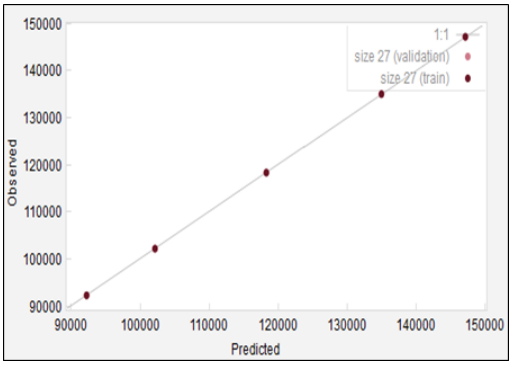

Figure 3. Observed V.S. Predicted Plot

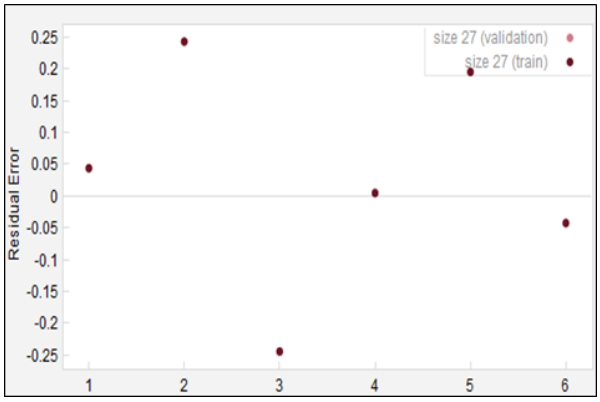

Figure 4 Residual Error Plot

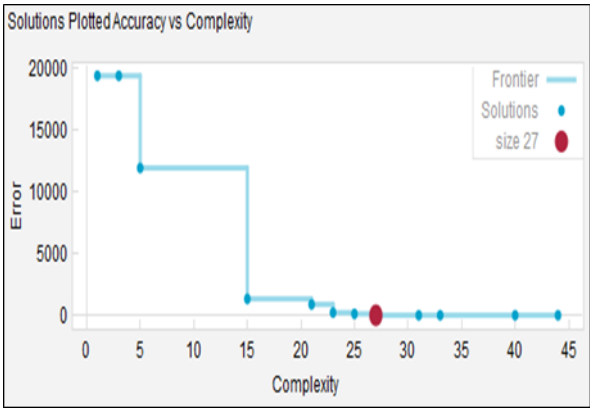

Figure 5. Solutions Plotted Accuracy VS Complexity

Table 3 shows that the foremost problem of the Philippines in the year 2011 was the air/water pollution/dirty environment which means that the country did not properly sustain the cleanliness of the surroundings and the trashes were visible to the Korean tourists coming in to the Philippines. However, from the years 2012 to 2016 the major issue was the heavy traffic in the country which means that most of their time was consumed traveling and they cannot reach their destinations on time, thus lessens their leisure activities. This issue was not yet properly addressed and/or resolved by the authorized organization because it was still the foremost complaints of the tourists for almost five years. On the other hand, the lowest complaint of the tourists in the year 2011 was crime incident, poor peace and order situation. This implies that the authorized department in the peace and order was trying to improve and develop the country's peace and order but still, it needs more efforts to fully implement such in order to market our country globally knowing that the safety of the tourists is the main concern of the

Filipinos. In the years 2012 and 2016, the nethermost dislike of the tourists was widespread poverty/beggar/unemployment. This entails that mendicants were visible and kept on asking for money on streets which irritated and frightened them. In year 2013, arrogant and corrupt government officials were the least dislike of the Koreans with 0.10% only which implies that there were few officials in the Department of Tourism and/or related tourism sectors who were not hospitable and helpful to Koreans. However, this issue was only present in this year, thus it was given immediate action. In 2014 and 2015, unpalatable food in restaurants and hotels was also mentioned as the least issue with the percentile of 1.10 and 0.30 % respectively. This is because the Filipino cuisine is generally sweet or is diverse from the usual meal of Koreans.

In addition, the problems persisted from 2011 to 2016 were the following: a) heavy traffic; b) air/water pollution/ dirty environment; c) widespread poverty/ beggar/ unemployment; d) rainy/ humid/bad weather; e) crime incidents, poor peace and order situations; f) poor airport facilities; and g) dishonest/ reckless taxi driver.

In the years 2011 and 2012, language barrier, people asking for tips, and delay service/slow/lazy people were problems present, but ceased in the years after. This implies that the people in the Philippines particularly in the tourism industry can now easily communicate to the tourists; this must be because the people behind the industry were more professional and educated and they were encouraged to study other languages to become more competitive so that they can accommodate more international tourists and also to further conform with our hospitality and tourism industry orientation that is to satisfy the tourist's needs and wants. They were also aware of the do's and don'ts of the industry. Similarly, they were after with the guest's satisfaction in order to secure the loyalty of the customers. In the end, it is more expensive to look for a new customer than to keep a loyal one. Lastly, they were given incentives to work hard for the betterment of the industry.

With the country's continued cultural development, there were also new problems aroused within the years studied. These were the following: a) bad roads (2013 to 2016), this shows that the country didn't have proper maintenance of its road facilities and they didn't even repair the road that cracked which resulted to disgusting experience of the Koreans; b) unpalatability of foods (2013 to 2016), this means that the market of the tourism in the Philippines were open globally, so the people in the industry must know all kinds of cuisine to further satisfy the taste of the tourists; c) dirty toilets/ no toilet papers (2013 to 2015), this implies that the Department of Environment and Natural Resources were implementing the no cutting of trees policy and the public toilets were not properly maintained or the assigned personnel overlooked the job; and d) poor/ inadequate public transportation facilities (2013 to 2016), this indicates that the transportation facilities of the Philippines were poor in hygiene and not tourist friendly. It also gave wrong information to the tourists about their destination.

In the years 2011 and 2012, there were ten (10) dislikes that most of the Koreans cited about the Philippines (see Table 3), however by the year 2013 up to 2016, there were sudden increase of the things dislike. It implies that the more tourists coming in to the Philippines the less it can be managed by the country. Likewise, the Philippines increases its population every year so there is a domino-effect and that is the reason why there are widespread poverty, beggar, unemployment, heavy traffic, pollution, dirty environment, poor peace and order, and reckless and dishonest taxi drivers.

Table 3. Data on Things Disliked most about the Philippines

YEAR 2011	%	YEAR 2012	%
Heavy traffic	30.60	Heavy traffic	47.10
Air/water pollution/ dirty environment	33.70	Air/water pollution/ dirty environment	45.00
Widespread poverty/ beggar/ unemployment	3.90	Widespread poverty/ beggar/ unemployment	.10
Rainy/Humid/Bad weather	0.90	Rainy/Humid/Bad weather	1.30
Language barrier	0.90	Language barriers	0.60
Crime incidents, poor peace and order situations	0.50	Crime incidents, poor peace and order situations	1.20
People asking for tips	3.10	People asking for tips	3.00
Delay service/slow/lazy people	1.30	Delay service/slow/lazy people	2.10
Poor airport facilities	3.00	Poor airport facilities	5.10
Dishonest/ reckless taxi driver	1.80	Dishonest/ reckless taxi driver	0.90

YEAR 2013	%	YEAR 2014	%
Heavy traffic	37.20	1. Dishonest/ reckless taxi driver	2.40
Air/water pollution/ dirty environment	36.30	2. Rainy/Humid/Bad weather	2.80
Widespread poverty/ beggar/ unemployment	1.60	3. Heavy traffic	52.30
Bad roads	12.12	4. Air/water pollution/ dirty environment	22.30
Rainy/Humid/Bad weather	3.10	5. Bad roads	10.80
Poor airport facilities	4.90	Widespread poverty/ beggar/ unemployment	0.80
Dishonest/ reckless taxi driver	1.80	8. Crime incidents, poor peace and order situations	1.50
Unpalatable food in restaurants/ hotels	1.10	9. Poor airport facilities	8.80
Dirty toilets/ No toilet papers	8.60	8. Poor/ inadequate public transportation facilities	1.10
Crime incidents, poor peace and order situations	1.30	9. Unpalatable food in restaurants/ hotels	0.60
Poor/ inadequate public transportation facilities	1.20	10. Dirty toilets/ No toilet papers	8.20
Arrogant corrupt government officials	0.10		

YEAR 2015	%	YEAR 2016	%
Dishonest/ reckless taxi driver	2.40	Heavy traffic	59.70
Heavy Rainy/Humid/Bad weather	2.20	Air/water pollution/ dirty environment	7.00
Heavy traffic	70.90	Poor airport facilities	2.90
Air/water pollution/ dirty environment	6.00	Heavy Rainy/Humid/Bad weather	2.40
Bad roads	4.60	Widespread poverty/ beggar/ unemployment	0.50
Widespread poverty/ beggar/ unemployment	0.60	Dishonest/ reckless taxi driver	3.30
Crime incidents, poor peace and order situations	0.60	Dirty toilets/ No toilet papers	9.60
Poor airport facilities	4.50	8. Bad roads	3.80
9. Poor/ inadequate public transportation facilities	0.60	9. Unpalatable food in restaurants/ hotels	2.80
Unpalatable food in restaurants/ hotels	0.30	10. Poor/ inadequate public transportation facilities	1.40

CONCLUSION & RECOMMENDATION

The behavior of Koreans is dependent on the cultural tourism that the Filipinos can offer. Their arrival in the Philippines is increasing positively even though the number of negative impressions is also increasing. Culture is a way of life of a Filipino. However, the ability of a country in giving importance to its culture is currently one of the main struggles. Despite these struggles, tourists are still willing to purchase the products and services in the Philippines. However, if the situation continues, there is a likelihood that the tourist arrival will decline. The law making bodies and implementers should give more effort in inspecting the conducts and performances of the tourist drivers so that cultural tourism in the Philippines will boost more. Additionally, poor airport facilities, which is considered the country's gateway and gives first impression of the country, must be prioritized.

It is therefore suggested that the management of all service industry must have the right measure of how the service should be rendered to the tourist. They must possess professional hospitality and restore good manners of a Filipino to further gratify tourists. Moreover, the government must consider the developing of the country's infrastructure to make the entire transactions firm and to realize the tourists' satisfaction as well.

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ISPSC-TAGUDIN CAMPUS GRADUATE SCHOOL DIMENSIONS IN EMPOWERING THE PROFESSIONALS

Mr. Lito W. Binay-an
Ilocos Sur Polytechnic State College, Tagudin Campus, Philippines

ABSTRACT

The study assessed the ISPSC's Graduate School dimensions in empowering the professionals at Tagudin Campus, Tagudin, Ilocos Sur for the School Year 2017-2018. Specifically, it looked into the personal and socio-economic profiles of the respondents along gender, age, work status, type of work, agency, work position, salary status and number of times promoted in position, salary and benefits. The possible main reasons of enrolling in the Graduate School and why took it at ISPSC, Tagudin Campus. Further, it looked into the level of fulfilment of the masters' students along intellectual, personal, social and cultural. Eighty two (82) graduate students who served as respondents. The study uncovered that majority of those enrolling in ISPSC Graduate School Tagudin Campus were females, young, serving the DepEd and occupying the bottom items. Affordable and reasonable fees encourage the young teachers to enroll in the Graduate School. Job promotions or higher positions and salary increases also motivates them to take up Graduate School studies. The Graduate School dimensions of empowerment are contributing very much on the intellectual and social dimensions of the students. Promotion in position, salary and benefits have high relationships with the four dimensions namely: intellectual, personal, social and cultural dimensions. The following are highly recommended: More programs in the Graduate School of ISPSC, Tagudin Campus should be created to cater the educational needs of those individuals not in the academe. Maintain the reasonable fees of the Graduate School so that more individuals thirsty of knowledge can afford postgraduate studies. There should be a holistic empowerment of masters students along intellectual, personal, social and cultural dimensions. Students should not only enroll for uniting purposes but to finish their program for an easier promotion in position and eventually salary increases. The administration may also consider the offering of doctoral degrees in the campus .

Keywords: School Dimensions, Empowering the Professionals

INTRODUCTION

The Graduate School, being the apex of the curricular offerings of the Ilocos Sur Polytechnic State College, Tagudin, Ilocos Sur has produced a number of professionals who were been promoted in their works, had reached their goals in life, and had acquired professionalism. They acquired vast knowledge that made their horizons wider and developed positive outlooks in life. They acquired deeper positive Filipino values which are needed in their personal and career enhancements. Through this, they have come to experience and accept that one can reach the underprivileged sectors of the society through extension services which they have experienced in the Graduate School Program. They can empower others through the many skills they have shared in their Adopt-a-School and Adopt-a-Barangay programs.

Aside from the skills that they shared to the townsfolk, teachers and children, they shared information and indispensable knowledge on how to keep and protect their rights, how to keep ecological waste management and how to maintain a simple but decent living through livelihood programs presented. Through these activities, the college has fulfilled its mission in some ways, i.e. in extension services, instruction and production. It has, likewise, fulfilled some instruction goals since the Graduate School students and professors have conducted remedial reading programs for slow readers including numeracy and literacy for the needy children.

When the Graduate Program has helped the countryside through the strategic interventions

extended, it has likewise developed in these Graduate School students and professors deeper Christian values. They have tasted the value of charity, temperance, self-fulfillment and piety as they cared, not only for themselves and their families, but for their unknown brothers and sisters waiting for their ingenuity and competence in empowering the needy. Indeed, they have not only empowered the people in their extension sites but they have empowered themselves.

There has been no research so far in the making about empowering these professionals in the ISPSC Graduate School so it is the goal of the researcher to undertake one so as to gauge their level of fulfilment on their capacity, competence, knowledge and prestige along intellectual, personal, social and cultural dimensions. Hence, this research.

OBJECTIVES

The study sought answers to the following sub-problems:

1. What is the personal and socio-economic profile of the respondents in terms of: gender; age; work status; type of work; agency; work position and salary?
2. What are the possible main reasons for taking up graduate studies?
3. What are the further main reasons why decided to enroll at ISPSC, Graduate School, Tagudin Campus?
4. What is the level of fulfillment of the respondents on their capacity, competence, knowledge and prestige along the following dimensions: intellectual; personal; social and; cultural dimensions?
5. Is there a significant relationship between the personal and socio-economic profile of the respondents and their dimensions of empowerment in finishing the degree along: capacity, competence, knowledge and prestige?

METHODOLOGY

The study used of the descriptive-evaluative survey design of research wherein data were obtained from the results of the retrieved questionnaires. It was conducted at ISPSC, Tagudin Campus, Tagudin, Ilocos Sur. The respondents were the 52 graduate school students who enrolled in the campus for Summer, School Year 2017-2018. Total enumeration was observed because of the minimal enrolment.

To attain a wholesome and credible evaluation, a questionnaire which was adopted form a previous study of Santiago Campus was used to gather the relevant data. To analyze the data gathered in this study, simple frequency counts, mean value and rank order were observed. The Five-point Likert Scale was used to quantify the gathered data ready for tabular presentation and interpretation.

Legends Used:
VMR-Very Main Reason
MR-Main Reason
NAR-Not a Reason
Cap-Capacity
Com-Competence
Kno-Knowledge
Pre-Prestige
VH-Very High
H-High
R-Rank
AMV-Average Mean Value
DER-Descriptive Equivalent Rating
I – Interpretation
** - significant at .01 level
PV – probability value
D – Decision
* - significant at .05 level
Cc – correlation coefficient
H0 – Null Hypothesis

RESULTS AND DISCUSSIONS

Profile of the ISPSC Graduate School Students

The personal and socio-economic profile of the Graduate School students enrolled in ISPSC Tagudin Campus for School Year 2017-2018 included their age, gender, major field of specialization, year level, employment status, type of work, agency, work position, agency, salary bracket, number of times promoted in position, salary increase and benefits. Table I shows the results the information obtained from the respondents.

Along the age bracket range considered, 21.2 percent were on their 27 to 31 years of age, 44.2 percent were within age bracket of 32 to 36 years, 11.5 percent within 22-26 years old, 17.3 percent within 37-41 years. Further, 2 were considered very young with 21 years or below while 1 was already 42 and above years old. Generally, the teachers who enrolled in the Graduate School of ISPSC, Tagudin Campus were still considered on

their young to getting old ages. The motivation of enrolling in the graduate school is when the individual is still fresh in her/his academic inclination and spending less specially for the single and those married individuals who are not yet supporting children in college.

Several social researches specially in the academe always claim that the teaching profession is a woman's world. This is because of its nature that you deal with young minds in school similarly like rearing the children at home which is the main duty of the wife. In this study, 80.8 percent were females while 19.2 percent were males. At any rate, some administrators prefer the males to do the supervisory works of the school especially in the far flung areas.

The work status of the respondents was only classified as employed or not employed. Of the 82 respondents, only one was not yet employed while 98.1 percent were on their own works. Almost all of them were in the teaching field while the one who was not yet employed might have a personal job and considered himself as non-teaching. ISPSC Graduate School caters the needs of the clientele in the academe the reason why almost all its students are in the teaching field Likewise, 90.2 percent were in the government service while 7.3 percent serve in the private schools. With the accessibility of the school campus, teachers in the nearby municipalities have set time for their academic growth. Teachers from the private sector also wanted to enroll to earn units or to finish their masters' program for ranking purposes when they intend to join the government teaching force.

Those teachers in the private sector receive lower pay than those in the government. It is implied that one reason for the teachers in enrolling in the Graduate Program of the campus is to at least elevate their salaries to higher ranks. Most of the teachers were promoted only once in both salary and benefits. The salary increase might be their step increment while staying long in their position. The government almost gave yearly benefits to the teachers. The promotion in position is harder to work on because there are still those almost retiring teachers who were left in the bottom position because of being passive. This is one of the reasons why the young ones are highly motivated to finish at least masters' level. Every year, enrolment in the Graduate Program of ISPSC- Tagudin Campus increases as per data bank of the registrar and more are graduating yearly.

Reasons Why Enrolled in the Graduate Programs

The following table shows the list of possible reasons why students enroll in the Graduate Program while the next table shows the possible reasons why they choose the Graduate Program of ISPSC, Tagudin Campus. They were asked to rate the given reasons as their very main reason, main reason, reason, sometimes a reason and not a reason. Self- fulfilment came out as their top very main reason followed by job promotion then aspiration for higher position as well as salary increase. Since most of the students enrolled in the Graduate Program of ISPSC, Tagudin Campus were holding the bottom item of Teacher I, then they also wanted to have an increased salary to meet the daily needs of their family. On the other hand, the item "employment is competitive" rank last because all of them except for one were already employed. The reason for demand of accreditation is also at the second to the last rank because the DepEd seldom subject their school programs for accreditation. For some, they enroll in the Graduate Program to earn units (unitize) for the sake of ranking purposes.

It came out from the assessment that the very main reason for why they enrolled in the Graduate Program is for financial stability since teaching is a low paid profession.

Table 1. Reasons why enrolled in the Graduate Program

Possible Reasons	MV	DER	Rank
1. Ranking purposes	4.20	VMR	6
2. Employment is competitive	4.10	MR	8
3. Job promotion	4.33	VMR	2
4. Aspiration for higher position	4.29	VMR	3
5. Economic reason/salary increase	4.25	VMR	4
6. "Unitize" for ranking increase	4.21	VMR	5
7. Self –fulfillment	4.54	VMR	1
8. Institutional demand because of accreditation	4.12	MR	7
Average mean:	4.26	VMR	

Reasons Why Enrolled in the Graduate Program of ISPSC-Tagudin Campus

Their reasons for choosing the Graduate Program of ISPSC Tagudin Campus were also included in the concluded survey. Of all the items considered, the item "fees are reasonable/ affordable" was first in rank. Since the Ilocos Sur Polytechnic State College is under State Colleges and Universities (SUC), it offers a very minimal tuition fee and the campus is very accessible to the upland municipalities which served as the service area of the Graduate School. They also believe that the faculty members in the foundation

courses are competent to do their jobs. Having a supportive administration was also one of the main reasons why they enroll in the Graduate Program of ISPSC-Tagudin Campus.

Table 2. Reasons why enrolled in the Graduate Program of ISPSC-Tagudin Campus

Possible Reasons	MV	DER	Rank
1. Fees are reasonable/affordable	4.50	VMR	1
2. Programs are within my specialization	4.06	MR	5
3. Quality(response, relevance, access) curricular programs	4.12	MR	4
4. Competent faculty members in:			
4.1. Foundation courses	4.19	MR	2
4.2. Major/ cognate courses	3.85	MR	9
5. Provision of elective courses	3.69	MR	10
6. Provisions of equipment & facilities			
6.1. Library	3.62	MR	11
6.2. Classrooms	3.56	MR	12
6.3. Computer units	4.04	MR	6
7. Supportive Administration	4.15	MR	3
8. Quality Professors	3.92	MR	7.5
9. Provision of personalized guidance to students	3.92	MR	7.5
10. Provision of scholarships	2.00	NAR	13
Average Mean:	3.82	MR	

On the other hand, the library, classrooms, provision of elective courses and scholarships were evaluated as last in ranks which may imply that they should be given priority attention by the administration specially for the library which is said to be the "heart of any school". At any rate, from the distribution of the questionnaire for this study, the Graduate School building was still on its completion, the Graduate School has already its own library but still lacks the library holdings to serve its clientele.

Graduate School Dimensions of Empowerment that had Contributed to Professional Growth of the Students

The study also tried to assess the ISPSC Graduate School dimension of empowerment that had contributed to professional growth along intellectual, personal, social and cultural. Results of the evaluation are seen in Tables 3 to 6.

Along Intellectual

Table 3 shows how the ISPSC Graduate School dimension of empowerment had contributed to professional growth along intellectual aspect. Of the 8 item statements listed, the item, "appreciate others e.g perceptions, points of view" was rank number one followed by "development of communicative skills" as second in rank. The item, "exploration of readings, open learning, closely supervised learning" was third. It can be seen on the same table that all the items were rated with "very high" except for item, "promotion of interactive learning" with a descriptive rating of "high" and a average mean value of 3.94 which made it the last in rank.

The over-all mean value of 4.34 described as "very high" implies that the students enrolled in ISPSC-TAGUDIN Campus has high regard to the Graduate School in the shaping of their intellectual personality.

Table 3. Graduate School dimension of empowerment that had contributed to professional growth along intellectual

A. INTELECTUAL DIMENSIONS	Cap	Com	Kno	Pre	AMV	DER	R
1.Promotion of interactive learning	3.96	3.84	4.04	3.92	3.94	H	11
2. Provision of opportunity for reflection/ Revision	4.20	4.20	4.24	4.16	4.20	VH	10
3. Increased knowledge in written output	4.32	4.24	4.32	4.36	4.31	VH	8
4.Frameworks/discourses/ perspectives.	4.32	4.20	4.20	4.28	4.25	VH	9
5. Promotion of innovativeness	4.36	4.36	4.36	4.44	4.38	VH	6
6. Promotion of decision making	4.36	4.28	4.40	4.40	4.36	VH	7
7. Exploration of readings, open learning, closely supervised learning	4.48	4.48	4.40	4.40	4.44	VH	3
8. Development of communicative skills.	4.52	4.44	4.42	4.52	4.48	VH	2
9. Cognitive understanding of phenomenon, environment	4.36	4.40	4.48	4.48	4.43	VH	4
10. Balanced judgment	4.32	4.40	4.44	4.48	4.41	VH	5
11. Appreciate others e.g perceptions, points of view	4.56	4.52	4.56	4.60	4.56	VH	1
	Over-all Mean:				**4.34**	**Very High**	

Along Personal

On the personal aspect as dimension of empowerment that contributed to the professional growth of the student-respondents, Table 5 reveals the assessed information. It can be gleaned on the table that out of 7 items, 3 were rated "very high" while 4 were "high". First in rank among the list was item,

Table 4. Graduate School dimension of empowerment that had contributed to professional growth along personal

C. PERSONAL DIMENSIONS	Cap	Com	Kno	Pre	AMV	DER	R
1. Opportunities for practice in self- experience	4.12	4.04	4.12	4.16	4.11	H	6
2.Develop self-awareness	4.20	4.16	4.11	4.12	4.15	H	4
3.Encouraging commitment	4.12	4.00	4.10	4.08	4.08	H	7
4.Weakening defensive attitudes	4.16	4.12	4.09	4.12	4.12	H	5
5. Improving attitudes, values	4.48	4.36	4.44	4.32	4.40	VH	1
6. Empowerment of the students	4.40	4.36	4.16	4.28	4.30	VH	3
7.Discipline,self-motivation,self-confidence, self- disclosure	4.48	4.40	4.36	4.18	4.36	VH	2
	Average Mean:				**4.22**	**Very High**	

"improving attitudes, values" with an average mean value of 4.40 followed by item, "discipline,

self-motivation, self-confidence, and self- disclosure" while item, "empowerment of the students" was third in rank. This implies that the students wanted to join the Graduate School of ISPSC Tagudin Campus because the school can help in shaping their personality and values as well.

On Social

The ISPSC Graduate School dimension of empowerment that had contributed to professional growth along social aspect of the student-respondents was also accounted for. Table 6 shows the results of such investigation. Among the eight (8) items-statements included, two were rated "very high" while six (6) wee "high". The top 2 in ranks were; "membership in professional, civic and community groups" and "understanding society" with average mean values of 4.36 and 4.28 respectively. In the Graduate Program of ISPSC, exposing its students to community immersion and extension activities under its community development as a subject is an avenue for the neophytes in the field to experience sharing their talents, knowledge and skills to the poor, deprived and underserved residents of the barangays. This is one way of answering one of the fourfold functions of the college which is extension.

The last in ranks were: "encouraging cooperation and awareness of others" and "developing a sense of social mobility and identity" with mean values of 4.08 and 4.00 respectively. At any rate, they were least in the ranked items but still considered as "high".

Table 5. Graduate School dimension of empowerment that had contributed to professional growth along social

D. SOCIAL DIMENSIONS	Cap	Com	Kno	Pre	AMV	DER	R
1. Encouraging cooperation and awareness of others	4.08	4.00	4.04	3.96	4.02	H	7
2.Developing a sense of social mobility and identity	4.12	4.04	3.96	3.86	4.00	H	8
3.Developing a sense of belongingness	4.24	4.16	4.08	4.16	4.16	H	3
4.Increased collaboration between the Social context-students, professors, community professional circles	4.12	4.12	4.16	4.08	4.12	H	6
5. Provision of accountability responsibility	4.24	4.12	4.12	4.06	4.14	H	5
6. Enriching my personal values and behavior	4.20	4.10	4.12	4.16	4.15	H	4
7. Understanding society	4.40	4.24	4.24	4.24	4.28	VH	2
8. membership in professional, civic and community groups	4.32	4.36	4.36	4.40	4.36	VH	1
	Average Mean:				4.15	High	

On Cultural

The fourth dimension included in the assessment of ISPSC's Graduate School dimension of empowerment that had contributed to professional growth of its student-respondents was along cultural aspect of life. There were only 5 item-statements included on this dimension of empowerment. The item that was given a "very high" descriptive rating was "analysis of attitudes and behavior of society" with an average mean value of 4.26. All the rest were rated "high" with the second in rank, "understanding different ethnic groups, like kankanaey, bago, mangyan etc." followed by, "realizing cultural practice, beliefs, traditions" then item, "realizing cultural practice, beliefs, traditions" while the last was, "development of values" with average mean values of: 4.09; 4.05; 4.04 and 4.02 respectively.

Table 6. Graduate school dimension of empowerment that had contributed to professional growth along cultural

E. CULTURAL DIMENSIONS	Cap	Com	Kno	Pre	AMV	DER	R
1. Development of values	4.08	4.02	3.96	4.02	4.02	H	5
2. Realizing cultural practice, beliefs, traditions	4.12	4.04	4.04	4.00	4.05	H	3
3. Realizing cultural practice, beliefs, traditions	4.08	4.04	4.00	4.03	4.04	H	4
4.Understanding different ethnic groups, like kankanaey, bago, mangyan etc.	4.10	4.12	4.08	4.06	4.09	H	2
5. Analysis of attitudes and behavior of society	4.34	4.24	4.16	4.30	4.26	VH	1
Average Mean:					4.09	High	

Correlation between Profile Variables and the Four Dimensions

The significant relationship between the profile variables and the four dimensions such as personal, intellectual, social and cultural was also tested using the Pearson Product Moment of Correlation or Pearson r through the Statistical Package for Social Sciences (SPSS). Results of the computations are seen in Table 7. Agency as either teaching in private or government was seen to have significant relationship with cultural dimension with a correlation coefficient of -.440* and a probability value of .028 at .05 level of significance. This implies that when you work in the government institutions, there is a tendency to be mingling with different students of different ethnic groups with different beliefs, practices and traditions. Position of work was also seen to have significant relationship with personal, intellectual and cultural with computed r of -.425, -.442, and -.506 respectively. Wok position is significantly related to cultural dimension at .01 level. Further, promotions of position, salary and benefits were all having significant relationship along personal, intellectual, social and cultural. The findings imply that intellectual and personal growth are being

honed and developed when the individual is being promoted specially on salary increase. This also includes social and cultural inclinations of the teacher.

Table 7. Correlation between profile variables and the four dimensions.

Profile Variables	PERSONAL		INTELLEC-TUAL		SOCIAL		CULTUR-AL		I	D
	Cc (r)	PV	Cc (r)	PV	Cc (r)	PV	Cc (r)	PV		
Agency							-.440*	.028	S	Reject H_0
Work Position	-.425*	.034	-.442*	.027			-.506**	.010	S	Reject H_0
Promotion in Position	-.614**	.001	-.563**	.003	-.567**	.003	-.674**	.001	S	Reject H_0
Promotion in salary	-.546**	.005	-.495*	.012	-.478*	.016	-.634**	.001	S	Reject H_0
Promotion in benefits	-.546**	.005	-.496*	.012	-.476*	.014	-.636**	.002	S	Reject H_0

CONCLUSIONS

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

1. Majority of those enrolling in ISPSC Graduate School Tagudin Campus are females, young, serving the DepEd and occupying the bottom items.
2. Affordable and reasonable fees encourage the young teachers to enroll in the Graduate School. Job promotions or higher positions and salary increases also motivate them to take up Graduate School studies.
3. The Graduate School of ISPSC Tagudin Campus contributes very much on the empowerment of the clientele on their intellectual and social dimensions.
4. Promotion in position, salary as well benefits have high relationships with the four dimensions namely: intellectual, personal, social and cultural dimensions.

RECOMMENDATIONS

The following are highly recommended:

1. More programs in the ISPSC Graduate School Tagudin Campus should be created to cater the educational needs of those individuals not in the academe.
2. Create a scheme on how to accommodate teachers in the Senior High School in the government who are not masters' degree holders to finish their masters in the campus.
3. Maintain the reasonable fees of the Graduate School so that more individuals thirsty of knowledge can afford postgraduate studies.
4. There should be a holistic empowerment of masters' students along intellectual, personal, social and cultural dimensions.
5. The administration may also consider the offering of doctoral degrees in the campus

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SELF-EFFICACY AND SELF- REGULATION OF OMSC STEM STUDENTS IN CHEMISTRY

Luningning M. Mendoza
Research Coordinator
Occidental Mindoro State College- Sablayan Campus

Mamerto C. Mendoza
Program Head, BSIT
Occidental Mindoro State College- Sablayan Campus

ABSTRACT

This study was conducted to relate self-efficacy and self- regulation to the performance in Chemistry of STEM students in Occidental Mindoro State College. Specifically, it aimed to : describe the demographic profile of the respondents in terms of sex, highest educational attainment of parents, level of socio-economic status and learning environment; the determine level of self- efficacy, self-regulation and academic performance of the respondents in Chemistry; analyze the relationship of demographic profile of the respondents to the level of self- efficacy and level of self-regulation in Chemistry; and determine the relationship of level of self – efficacy self-regulation to academic performance of the respondents in Chemistry. The study used a descriptive correlational research design. The respondents of the study were the 78 Grade 11 STEM Senior High School students of Occidental Mindoro State College Labangan Campus during the Academic Year 2017-2018 who were selected using stratified random sampling. The researcher adopted and validated the Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich and De Groot . Frequency, percentage, mean and Pearson r correlation were the statistical tools employed in this study. Results showed that majority of the respondents were female, parents were college graduates and came from lower class families who considered their classroom in Chemistry as a negative learning environment. The level of self-efficacy and level of self-regulation of the respondents in Chemistry subject were both moderately high. The level of academic performance in Chemistry was Very Satisfactory. Sex, level of socio-economic status and learning environment were significantly related to the level of self-efficacy. Only learning environment was found to have significant relationship with the level of self-regulation. Both the level self-efficacy and level of self-regulation had significant relationship with the level of academic performance in Chemistry .

Keywords: socio-demographic profile, self-efficacy, self-regulation, performance, Chemistry

INTRODUCTION

Chemistry is considered as one of the tough subjects (Tsaparlis et al., 2010) which is difficult to teach and to learn at both secondary and tertiary levels. Major learning difficulties are due to the particular views of Chemistry phenomena that in many ways contradict intuitive and everyday views of the learners. Njoku and Eze-odurukwe (2015) mentioned in their study that one of the main reasons students find many Chemistry concepts difficult is the high level of abstraction of these concepts, and the teachers often do not have the necessary resources to make them more concrete through laboratory demonstration and experimentation. It is an observation that sometimes repels learners from continuing with studies in Chemistry.

Moreover, many find it is particularly hard because of the hybrid nature of learning. Learning Chemistry is about mastering problem solving skills by understanding the concepts and becoming familiar with the rules. Chemistry is a "why" Science; its concepts and principles explain many of the "why" questions in daily life as most of students have experienced, at first Chemistry seems difficult, yet it is very learnable if you know how (Huang & Green, 2009, p.3). Suggestions are made on ways to minimize the problems based on understandings of attitudes and motiva-

tion as well as the psychological understandings of how learning takes place.

To survive Chemistry, a student must be motivated and use learning strategies. Academic motivations in terms of self-efficacy and learning strategies have significant positive relationship with academic achievement. Self-efficacy is the belief that individual has regarding own capability to perform an action and accomplish the task magnificently. Self-efficacy plays a significant role in enhancing learning motivation, facilitates self-regulation, forming ambitious learning goals and exhibits self-monitoring behavior (Valle et al., 2008).

Learning strategy is defined as a conscious that integrates a set of specific behaviors in order to accomplish a recurring task successfully (Lam, M.Y. and Norlizah, C. H., 2015). One learning strategy is self- regulation. Self-regulated learning is the strategy that utilized by students in regulating own cognition and managing the resources throughout the learning process. It is a multi-dimensional activity that takes into consideration of cognition, emotion, action and surroundings of the learners (Cheng, 2011). In the self-regulated learning process, student is given the autonomy to manage, observe, guide and regulate own actions in order to achieve the goals of gaining knowledge, widen the expertise and improve oneself. These students learn to concentrate on accomplishing the learning tasks despite of immediate impulses to surrender to attractive temptations (Bembenutty, 2008). Self-regulated learning has long been associated to self-efficacy, since the first one depends on personal perceptions of efficacy, among other things.

Learners high on self-regulation, both high and low-achieving, tend to exhibit a high sense of efficacy in their own capabilities (Duckworth et al., 2009). In this same trend, one of the three motivational components with the highest influence on academic achievement is considered to be self-efficacy. Its influence on students' motivation is so important that it is considered the most powerful predictor of academic performance, effort and persistence.

In Occidental Mindoro State College, some STEM students were struggling in Chemistry subjects. The researchers would like to determine the self-efficacy and self- regulation of these students in relation to their academic performance in Chemistry.

OBJECTIVES

The main purpose of this study was to relate self-efficacy and self- regulation to the performance in Chemistry of STEM students in Occidental Mindoro State College. Specifically, the study aimed to:

1. Describe the demographic profile of the respondents in terms of:
   - Sex
   - Highest educational attainment of parents
   - Level of socio-economic status
   - Learning environment;
2. Assess level of self- efficacy and self-regulation of the respondents towards Chemistry;
3. Determine the level of academic performance in Chemistry;
4. Analyze the relationship of demographic profile of the respondents to level of self-efficacy and level of self-regulation in Chemistry; and
5. Determine the relationship of the level of self – efficacy and level of self-regulation to academic performance of the respondents in Chemistry.

METHODOLOGY

The study used a descriptive correlational research design. This survey research described the demographic profile of the respondents in terms of sex, educational level of the parents, level of socioeconomic status and the learning environment. Moreover, it assessed the level self- efficacy and self-regulation and the performance of the respondents in Chemistry subject. Furthermore, this study determined the relationship among these variables.

The respondents of the study were the Grade 11 STEM Senior High School students of Occidental Mindoro State College Main Campus during the Academic Year 2017-2018. There were four sections in Grade 11 STEM with the population of 97 students. Using the on-line sample size calculator, out of this population, 78 were selected as sample. These respondents were chosen randomly. Ethical considerations were observed when dealing with respondents who were minor. The researchers asked consent from the parents of the minor respondents. Participation of the students was voluntary. The 78 respondents were informed about the study, given the necessary directions about answering the items of the instru-

ments, requested to cooperate with the researcher by being honest in answering the items of the scales and tests, and that their answers would be held confidential and not influence their school grades in any way.

The researcher adopted the Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich and De Groot (1990) to measure students' self –efficacy beliefs and self-regulated learning of the respondents. The instrument will have three parts. The first part is about the profile of the respondents. The second part and last part are self-efficacy and self-regulation scale which is a 5-point Likert-type scale. The adopted questionnaire was modified and undergone validation.

The researcher sought permission from the Principal of the Senior High School of OMSC before the conduct of the study. The students responded to a self-report questionnaire (the Motivated Strategies for Learning Questionnaire—MSLQ, included items on self-efficacy and self-regulation using the survey questionnaire. Students were instructed to respond to the items on a 5-point Likert scale (1 very untrue of me to 5 = very true of me) in terms of their behavior in the Chemistry class. Academic performance was be measured by collecting their acquired grade in Chemistry. Grades range from 75 and above.

In describing the demographic profile of the respondents, frequency and percentage were utilized. The value of mean was considered to determine the level of self-efficacy, self-regulation and academic performance of students in Chemistry. To analyze the relationship among demographic profile, self-efficacy self-regulation and academic performance of students in Chemistry, Pearson r correlation was employed.

FINDINGS

Demographic profile of the respondents

The first objective of the study was to describe the demographic profile of the respondents. These characteristics were -sex, educational attainment of parents, level of socio-economic status and learning environment.

Sex

The respondents were required to state their sex. The valid sex was either male or female.

Table 1 shows the demographic profile of the respondents of the study. Greater part of the STEM student respondents were females (55.1%), and 44.9 percent were males. This implied that there were almost an equal number of enrollees of male and female students in the STEM strand who wanted to pursue Science courses in college.

Educational attainment of parents

The educational attainment of the parents was considered because parents were the first stakeholders to contribute to the provision of effective education for their children (Tuyisenge, 2015).

Most of the respondents' parents were college graduates (57.7%). These data implied that majority of the respondents were highly educated. Parents with more education can guide and teach their children more because they have higher background knowledge which they can easily transfer to their children.

Table 1. Demographic profile of the respondents.

Demographic Profile of the respondents	Frequency (n=78)	Percentage (%)
a. Sex		
Female	43	55.1
Male	35	44.9
b. Highest Education attainment of parents		
Master's degree and Doctorate degree holder	2	2.6
College graduate	45	57.7
College undergraduate	3	3.8
Vocational course graduate	2	2.6
High School graduate	18	23.1
High School undergraduate	2	2.6
Elementary graduate	6	7.7
Elementary undergraduate	0	0
No formal schooling	0	0
c. Level of socio-economic status		
Upper class	7	9.0
Middle class	31	39.7
Lower class	40	51.3
d. Learning environment		
Positive learning environment	37	47.4
Negative learning environment	41	52.6

Parents with higher education also have higher expectation for their children's education which facilitate the greater educational attainment for their children (Acharya, Joshi & Simiyu, 2009).

Level of socio-economic status

Socioeconomic status (SES) encompasses not just income but also educational attainment, financial security, and subjective perceptions of social status and social class.

The distribution revealed that 51.3% of the respondents came from lower class families. The findings indicated that that the family encountered difficulties in supporting good education for their children.

Learning environment

Learning environment refers to a place where teaching and learning take place in the most effective and productive manner.

More than half of the number the respondents considered their classroom in Chemistry as a negative learning environment (52.6%) wherein they did not feel comfortable and confident during the class. This means that there were some distractions that caused discomfort in the learning environment which can be expected to interfere with learning.

Level of self-efficacy and self- regulation of the respondents in Chemistry.

Table 2 presents the level of self-efficacy of the respondents in Chemistry where most items were ranked Moderately High ranging from 2.89 to 3.35 which means that the respondents had Moderately High level of self-efficacy in Chemistry (grand mean= 3.22). This implied that the STEM students had medium level of certainty that they can understand the ideas taught in Chemistry subject and fairly expected to do well in the class. The highest mean was on I know that I will be able to learn the material for this subject (mean= 3.54), interpreted as High Self-efficacy. The respondents also believed that they are certain that they I can understand the ideas taught in Chemistry subject and expect to do very well in Chemistry class. Both had mean= 3.35 and interpreted as Moderately High Self-efficacy. Lowest mean was on the item, my study skills are excellent compared with others in this class (mean= 2.89). However, it was also interpreted as Moderately High Self-efficacy.

Table 2. Level of Self-efficacy of the respondents in Chemistry

Statement	Mean	Interpretation
1. Compared with other students in this Chemistry class I expect to do well.	3.23	Moderately high
2. I'm certain I can understand the ideas taught in Chemistry subject.	3.35	Moderately high
3. I expect to do very well in Chemistry class.	3.35	Moderately high
4. Compared with others in Chemistry class, I think I'm a good student.	3.08	Moderately high
5. I am sure I can do an excellent job on the problems and tasks assigned for Chemistry subject.	3.18	Moderately high
6. 1 think I will receive a good grade in the Chemistry subject.	3.30	Moderately high
7. My study skills are excellent compared with others in this class.	2.89	Moderately high
8. Compared with other students in this class I think I know a great deal about the Chemistry subject.	3.04	Moderately high
9. I know that I will be able to learn the material for this subject.	3.54	High
Grand Mean	**3.22**	**Moderately High**

This finding was similar to the study of Pihie and Bagheri (2011) who found that students perceived themselves as moderately high in self-efficacy.

Table 3 reveals the level of self-regulation of the respondents in Chemistry which was moderately high (mean= 3.24).

Table 3. Level of Self-regulation of the respondents in Chemistry

Statement	Mean	Interpretation
1. I ask myself questions to make sure I know the material in Chemistry that I have been studying.	3.46	High
2. When work is hard, I either give up or study only the easy parts in Chemistry subject.	3.06	Moderately High
3. I work on practice exercises and answer end of chapter questions in Chemistry subject even when I don't have to.	3.05	Moderately High
4. I ask myself questions to make sure I know the material I have been studying.	3.40	Moderately High
5. Before I begin studying Chemistry I think about the things I will need to do to learn.	3.35	Moderately High
6. I often find that I have been reading for class but don't know what it is all about.	2.94	Moderately High
7. I find that when the teacher is talking I think of other things and don't really listen to what is being said.	3.09	Moderately High
8. When I'm reading Chemistry lesson I stop once in a while and go over what I have read.	3.22	Moderately High
9. 1 work hard to get a good grade in Chemistry even when I don't like the class.	3.56	High
Grand Mean	**3.24**	**Moderately High**

This means that the respondents somewhat regulate their own behaviors when necessary, control their motivations, set their metacognitive skills to work and monitor and assess their performances to direct their future learning in Chemistry. The highest mean was on I work hard to get a good grade in Chemistry even when I don't like the class (mean =3.56) interpreted as high self-regulation. This was followed by I ask myself questions to make sure I know the material in Chemistry that I have been studying (mean= 3.46) also interpreted as high self-regulation. The lowest mean was on the item, I often find that I have been reading for class but don't know what it is all about with the mean of 2.94 also interpreted as moderately high. The item, I work on practice exercises and answer end of chapter questions in Chemistry subject even when I don't have to also have a low mean which was 3.05.

These results supported the study of Sen (2016) who concluded that students who are successful in classroom setting employ their self-regulated learning skills more than those who are unsuccessful because self-regulated learners orientate their learning, and they assess their own learning output.

Level of academic performance of the respondents in Chemistry

Table 4 shows the academic performance of the respondents in Chemistry. Majority of the respondents (40.35%) had a grade of 85-89 in the subject which was interpreted as Very Satisfactory. 36.85% of the respondents was Outstanding and 22.81% had satisfactory performance. The level of their academic performance in Chemistry based on their grades was Very Satisfactory (mean=87.75). This implies that the respondents did well in their Chemistry subject.

The very satisfactory performance of the respondents could also be the result of their moderately high self-efficacy and self-regulation. This finding supported the study of Schunk and Zimmerman (2008) who suggested that self-regulated learners also perform better on academic tests and measures of student performance and achievement.

Table 4. Level of Academic Performance of the respondents in Chemistry

Grade in Chemistry	Frequency n=78	Percentage (%)
90-100	29	36.85
85-89	31	40.35
80-84	18	22.81
75-79	0	0
74 and below	0	0
	Mean=87.75 (Very Satisfactory)	

Relationship between demographic profile and self- efficacy of the respondents in Chemistry

Table 5 shows the relationship of demographic profile of the respondents and their self-efficacy in Chemistry. Sex, level of socio-economic status and learning environment were significantly related to self-efficacy with r = 0.46 and p- value = 0.00; r=0.28 and p-value =0.03; and r= 0.5 and p value = 0.00 respectively. However, the highest educational attainment of the parents had no significant relationship with the self-efficacy of the respondents.

Table 5. Relationship of demographic profile of respondents and their self- efficacy in Chemistry.

Demographic profile	Pearson correlation r	p-value	Interpretation
Sex	0.46	0.00	Significant
Highest educational attainment of parents	-0.07	0.61	Not significant
Level of socio-economic status	0.28	0.03	Significant
Learning environment	0.50	0.00	Significant

These results implied that the sex of the respondent affect the level of self-efficacy which was similar to what was mentioned in the study of Tenaw (2013) that starting in grade seven, girls tend to underestimate their abilities in Math and Science.

Several studies have documented that female students have lower self-efficacy in Math and Science compared to male students. Girls' capabilities are undermined by sex-role stereotypes in many cultures intimating that females are not as able as males, especially in such disciplines as math and science. Another contributing factor could be the lower level of expectations that parents, teachers, and counselors often hold for girls, which can discourage further study in scientific and technical fields.

There was also a significant relationship between the socio-economic status of the respondents and their self-efficacy in Chemistry. This finding was in congruence with the result of the study of Karaarslan and Sungur (2011). They found out that socio-economic status of the students had positive relationship with self-efficacy in Science. Related research showed that high Socio-economic status families tend to provide resources stimulating students' cognitive development at their homes. Such cognitively stimulating home environment was found to be directly linked to student motivation including their self-efficacy.

In terms of learning environment, this study found out that it was significantly related to self-efficacy of the respondents in Chemistry. This was similar to the findings of McMahon, Wernsman, and Rose (2009) who carried out a study to explore the relationship between classroom environment and academic self-efficacy among fifth and sixth grade students from California. The findings confirmed the relationship and revealed that academic self-efficacy could be influenced by classroom environment.

Relationship between demographic profile and the level of self-regulation of the respondents in Chemistry

As shown in Table 6, among the demographic profile, only learning environment was found to have significant relationship with self-regulation with r= 0.5 and p – value = 0.00. This finding was supported by Sungur and Gungoren (2009). It was mentioned in their study that in general, classroom environments which encourage complex thinking skills and active student participation are likely to promote student self-regulation. Student centered classrooms where students have choice and control over their learning, have opportunity

to use variety of strategies, and interact with peers encourage development of self-regulation.

Table 6. Relationship of demographic profile of respondents and their self- regulation in Chemistry

Demographic profile	Pearson correlation r	p-value	Interpretation
Sex	-0.08	0.571	Not Significant
Highest educational attainment of parents	-0.10	0.47	Not significant
Level of socio-economic status	0.16	0.26	Not Significant
Learning environment	0.30	0.02	Significant

Relationship of level of self-efficacy and level of self –regulation of the respondents to their academic performance in Chemistry.

As indicated in Table 7, both the level self-efficacy and level of self-regulation of the respondents had significant relationship with their academic performance in Chemistry with r=0.56, p-value = 0.00 and r = 0.53, p-value =0.00 respectively. This result was similar to the findings of several researchers. According to Tenaw (2013), significant relationship exists between self-efficacy and achievement. In terms of self-regulation and academic performance, McClelland et al. (2006) linked self-regulation and academic success. They mentioned that children's ability to regulate their overt behavior in practical tasks like remembering instructions and working independently, is highly predictive of later academic and social functioning

Table 7. Relationship of Self-efficacy and Self – regulation of the respondents to their academic performance in Chemistry.

Variables	Pearson correlation r	p-value	Interpretation
Self-efficacy	0.56	0.00	Significant
Self-regulation	0.53	0.00	Significant

CONCLUSION

Based on the findings, the following conclusions are drawn;

1. Majority of the respondents were female, parents were college graduates and came from lower class families and considered their classroom in Chemistry as a negative learning environment.
2. The level of self-efficacy and self-regulation of the respondents in Chemistry subject were both moderately high.
3. The level of academic performance in Chemistry was Very Satisfactory.
4. Sex, level of socio-economic status and learning environment were significantly related to self-efficacy. Only learning environment was found to have significant relationship with self-regulation.
5. Both the level self-efficacy and level of self-regulation of the respondents had significant relationship with their academic performance in Chemistry.

RECOMMENDATION

Based from the findings of the study, below is the recommendation.

Educators may promote positive learning environment to increase self-efficacy classrooms self-regulation of the students which will bring success in academic performance.

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SOLID WASTE MANAGEMENT AWARENESS AND PRACTICES OF THE STUDENTS AND PARENTS OF OCCIDENTAL MINDORO STATE COLLEGE BASIC EDUCATION LABORATORY

Maria Marjorie V. Sales
Michelle G. Gabasa
Dr. Loida C. Lopez
Rogelio S. Daduros Jr.
College of Teacher Education
Occidental Mindoro State College
San Jose, Occidental Mindoro

ABSTRACT

This study was conducted on the basis that students' and parents' awareness and practices on solid waste management are very important factors in supporting the school in maintaining a clean, safe and orderly learning environment.
This study aimed to determine the awareness and practices of the students and parents on solid waste management. Specifically, the study was intended to: (1) determine the demographic profile of the respondents in terms of sex, educational attainment and type of occupation of parents; (2) determine awareness and practices of the respondents on Solid Waste Management; and (3) determine the relationship between the awareness and practices of the respondents on Solid Waste Management. A descriptive research design was employed. The respondents were the students who are presently enrolled this school year 2018-2019 and their parents who were drawn using stratified random sampling. The result of the study revealed that there is a relationship between the awareness and practices on solid waste management of the respondents. It only proved that awareness results to practice on solid waste management whether in school or at home. Also, whatever practice observed at home, will most likely be adopted and put into practice by the students. Since the study showed a remarkable result, an orientation on RA 9003, also known as the Ecological Waste Management Act of 2000, is recommended to be included in the action plan of the school administration so as to maintain the students' awareness and practices on solid waste management.

Keywords: Awareness, Practices, Solid Waste Management, R.A. 9003, Learning Environment

INTRODUCTION

A school is an institution designed to provide learning spaces and learning environments for the teaching of students (or "pupils") under the direction of teachers. This is where the totality of their personality is being molded, enhanced and developed. Since school is considered as the second home of every student, it is expected that it is clean and orderly at all times.

Teachers serve as the second parents of the students who guide and teach them to be successful in the future. They should train students not only academically but also in all aspects of their personalities. One of the most important traits that they should teach and develop among students is discipline, either inside the classroom, or when they are at home. But it is not the teachers alone who should accomplish this huge task but their parents as well. Students should have a follow up training at home.

The school recognizes and values parents and families as children's first teachers and decision-makers in education. Parents have a powerful role in supporting children's health and learning.

Parents should support the teachers and the school in maintaining a clean, safe and orderly learning environment, thus, expecting their children to observe all school rules and regulations including those on the solid waste management.

Solid Waste Management is defined as the discipline associated with control of generation, storage, collection, transport or transfer, processing and disposal of solid waste materials in a way that best addresses the range of public health, conservation, economics, aesthetic, engineering and other environmental considerations. (Leblanc 2017)

It was assessed that one of the major contributors to the above issue are wastes generated from the households, commercial establishments and agriculture production that were not properly disposed and managed by stakeholders concerned. The types of wastes commonly generated are food/kitchen wastes, papers, PET bottles, metals, and cans, boxes/cartons, glass bottles, cellophane/ plastics, and yard/garden wastes. (Bernardo, 2008).

Proper solid waste management among students should be strictly taught and observed as part of their discipline. Since it is frequently observed that the school grounds like the gymnasium, corridor and even classroom are most of the time untidy because of the litters, making it not conducive to look at, the school administrators are always doing their best to keep the whole campus clean. Proper waste management is being implemented but the scenario of improper waste disposal keeps on repeating because students keep on throwing their garbage anywhere.

It is not only the school administrators who are dreaming of a clean and ideal place or area but our government as well. They made a law about waste disposal. This is RA 9003 also known as the Ecological Waste Management Act of 2000, declaring the policy of the state in adopting a systematic, comprehensive and ecological solid waste management program that ensures the protection of public health and the environment and the proper segregation, collection, transport, storage, treatment and disposal of solid waste through the formulation and adoption of best environmental practices. (Aquino, et. al, 2013). This law should be publicized to both the parents and students.

This problem brought the researchers to work on the students' awareness about proper solid waste management as well as the knowledge of their parents about this issue. Are these children able to practice proper solid waste management at home? Do their parents teach them on proper waste segregation at home? How come they keep on making the campus messy by their littering?

The researchers wanted to determine the level of awareness and practices of both the parents and students in our institutions on proper solid waste management.

OBJECTIVES OF THE STUDY

This study basically sought to determine the perceived solid waste management awareness and practice among the parents of Occidental Mindoro State College laboratory students.

Specifically, the study aims to:

1. determine the demographic profile of the respondents in terms of:
   a. Gender
   b. Age
   c. Educational Attainment
   d. Occupation,
2. determine the level of the perceived Solid Waste Management awareness and practice among respondents,
3. determine if there is an association between the level of the perceived Solid Waste Management awareness and practice and profile of the respondents

METHODOLOGY

This study utilized the descriptive type of research to evaluate the awareness and practices on solid waste management among the Occidental Mindoro State College laboratory students and their parents.

There were one hundred fifty-three (153) students from elementary and secondary levels and one hundred fifty-three (153) parents who were selected as respondents. They were chosen using the stratified random sampling to ensure equal representation in this study. The chosen respondents were allowed to answer the instrument since their parents were also chosen as the respondents.

Percentage, weighted mean and frequency distribution were the descriptive statistics employed in presenting the awareness and practices on solid waste management among the respondents while Pearson r was used to determine the relationship between the awareness and practices.

FINDINGS

Based on the analysis, the following findings were obtained:

Table 1 presents the demographic profile of the respondents in terms of sex. Majority of the

students (54.25%) and parents (75.16%) were female. It also shows the educational attainments of the parents. It shows that majority of the parents were college graduate (83.01%).

Sex	*Students*	*Percent*	*Parents*	*Percent*
Male	70	45.75	38	24.84
Female	83	54.25	115	75.16
Composite Mean	**153**	**100.00**	**153**	**100.00**

Educational Attainment	*Students*	*Percent*	*Parents*	*Percent*
Elementary	71	46.41	1	.65
Secondary	82	53.59	7	4.58
Vocational			7	4.58
College			127	83.01
Post Graduate			9	5.22
Others			2	1.31
Composite Mean	**153**	**100.00**	**153**	**100.00**

Type of Occupation	*Parents*	*Percent*
Public	69	54.10
Private	84	54.90
Composite Mean	**153**	**100.00**

The students' average Knowledge, Attitude and Practices (KAP) ratings was significantly associated with students from medium-sized families (5-9 members), having parents with moderate academic backgrounds and held permanent jobs (Barloa et.al, 2016)

It also presents the type of occupation of the parents. It shows that most of the parents work in private sector (54.90%).

Table 2.1 displays the Respondent's Awareness about Solid Wastes Management, it shows that Majority (3.36) of the parents were aware of the Solid Waste Management, however the students were not so aware of this program about waste disposal. On the other hand, both students (3.58) and parents (3.75) were aware about the importance of recycling having the highest mean. Students (2.32) were not so aware about the Republic Act 9003 while parents were not aware of the corresponding sanctions of any violations of the SWM program (2.71) as well as the solid waste management committee of the school having the same mean of (2.70).

Table 2.1 Degree of Respondent's Awareness on Solid Wastes Management

Descriptions	*Students*		*Parents*	
	Mean	*Verbal Interpretation*	*Mean*	*Verbal Interpretation*
Republic Act 9003	2.32	A	2.93	NSA
Solid Waste Management (SWM) Program of the School	3.01	A	3.16	A
School's orientation on SWM Program	2.76	NSA	2.86	A
Policies of the SWM program	2.81	NSA	3.00	A
Corresponding sanctions of any violations of the SWM program	2.55	NSA	2.71	NSA
Solid waste management committee of the school	2.69	NSA	2.70	NSA
Purpose of the management on implementing the SWM program	2.94	NSA	3.03	A
School's SWM program is a big help in achieving clean and green environment	3.40	A	3.53	A
Importance of the SWM	3.37	A	3.64	A
Practicing SWM saves money and energy	3.20	A	3.51	A
Student`s roles and responsibilities towards school's SWM program	3.20	A	3.34	A
Unity is very significant in making up and internalizing the SWM	3.12	A	3.51	A
Implementation will be successful and effective if concerned people will participate	3.22	A	3.61	A
Discipline on SWM matters	3.15	A	3.55	A
Proper disposal of garbage	3.55	A	3.69	A
Possible illnesses that you can get whenever trashes are not properly disposed	3.39	A	3.69	A
Before throwing garbage, it is a must to read those trash-can labels for segregation	3.39	A	3.63	A
Identification of biodegradable from non-biodegradable	3.57	A	3.68	A
Importance of recycling	3.58	A	3.75	A
Waste minimization practices like reuse, recycle and reduce	3.54	A	3.66	A
Mean	**3.14**	**A**	**3.36**	**A**

According to Vivek,et al, 2013, there are serious drawbacks in the practicing of proper waste management among students. This is due to insufficient motivation from parents and teachers at this stage of growth period when they are preoccupied with preparation of many school activities.

Table 2.2 shows the degree of respondent's segregation practices on SWM. Having the total mean of (2.74) and (2.98) this presents that both of the students and parents seldom practice the segregation process in waste management. Wherein, the respondents seldom practice the mixing of all garbage in one container. This is supported by the study of Achari, 2005, that segregation has not been much practiced worldwide till recently for the common waste.

The table shows that seldom recycling is put into practice, it is supported by the study of Afroz, R. et.al, 2010, that recycling was seldom practiced because of the lack of time.

Table 2.2 Degree of Respondent's Segregation Practices

(SEGREGATION PRACTICES)	*Students*		*Parents*	
	Mean	*Verbal Interpretation*	*Mean*	*Verbal Interpretation*
1. I segregate biodegradable (paper, banana peels, cardboard, and vegetables) and non-biodegradable (plastic toys, glass, steel, rubber) wastes at school.	2.89	S	3.17	O
2. I separate recyclable wastes (paper, cardboard, plastic bottles) from non-recyclable (food wastes, leaves, twigs) wastes at school	2.93	S	3.18	O
3. I separate non-harmful wastes from toxic and hazardous wastes such as pentel pens, laboratory chemicals, ink, cell batteries and others.	2.89	S	3.20	O
4. I mix all the garbage in one garbage container.	2.24	S	2.33	S
5. I segregate recyclable items for collection.	2.75	S	3.01	O
Composite Mean	**2.74**	**S**	**2.98**	**S**

Table 2.3 Degree of Respondents Reduce Practices

(*REDUCE*)	Students		Parents	
	Mean	*Verbal Interpretation*	*Mean*	*Verbal Interpretation*
1. I borrow, share, and/or rent things that are needed occasionally.	2.77	S	2.83	S
2. I buy only what I need so that I will not end up throwing away extra food.	3.21	O	3.44	O
3. I pack my lunch in reusable lunchbox so that I can't buy wrapped/packed food at the school.	3.00	O	3.29	O
4.I bring water in reusable water bottles than buying water in one used plastic bottles at the school.	3.20	O	3.33	O
5. I am cautious and responsible to every waste I produced.	3.10	O	3.45	O
Composite Mean	**3.06**	**O**	**3.27**	**O**

According to Achari, 2005, ultimate, piling of plastics fibers, metals, paints, and other materials of mineral as well as organic origin become a threat to the societies.

Earlier studies indicate that nearly 20% reduction in waste generation is possible through simple housekeeping measure that requires no or marginal investment, according to Ahmadi, 2017. Student educates from their observations in surroundings specially at home.

Table 2.4 shows the Respondent's Reuse Practices on Solid Waste Management. The table shows that parents and students often practice the reusing of materials. Students seldom reuse scrap paper into memo pad, today most of the materials are ready made and available in any bookstore. Most of the students rather buy than make a scrap paper.

Table 2.4 Degree of Respondent's Reuse Practices

(REUSE)	*Students*		*Parents*	
	M	*VI*	*M*	*VI*
I reuse my old materials than buying a new one.	3.01	O	3.36	O
I keep those unfilled papers and used it as scratch.	3.15	O	3.52	O
I reuse grocery bags.	3.02	O	3.58	O
I reuse washable food containers.	3.25	O	3.57	O
I reuse scrap paper into memo pad	2.73	S	3.19	O
Composite Mean	3.03	O	3.44	O

Reuse is preferable to recycling since the item doesn't need to be reprocessed according to Ahmadi, 2017.

Table 2.5 shows the degree of respondent's recycling practices, it shows that Recycling was seldomly practiced

Table 2.5. Degree of Respondent's Recycle Practices

(RECYCLE)	*Students*		*Parents*	
	M	*VI*	*M*	*VI*
I convert or redesign waste materials into a new product.	2.61	S	2.73	S
I make decors out of plastic wrappers and other colorful waste materials	2.56	S	2.63	S
I ignore the importance of recycling.	1.80	N	1.83	N
I initiate generating income out of waste materials	2.46	S	2.71	S
Composite Mean	2.36	S	2.25	S

As stated by Achari, the cost of recycling process and value of reclaimed materials are economically viable. Everywhere, the generation of new policies, coordination, better management practices are implemented locally. The result reveals that parents never ignore the importance of the system of recycling.

Table 2.5 shows the degree of respondent's disposal practices. The table shows that both parents and students never dispose hazardous/toxic/ special wastes, throw garbage anywhere and burn materials. Hazardous wastes whether chemical, medical generated in laboratories requires regulated disposal to ensure safety of public heath and environment.

According to Rioux, R. et. al, 2019, proper waste disposal begins with good waste management by the researcher, including minimum waste

generation, reusing surplus materials, and recycling of appropriate (i.e., uncontaminated) waste. The generated waste must be properly collected and stored, paying close attention to labeling, segregating according to chemical compatibility, and accumulating in a well-ventilated location.

Table 2.5. Degree of Respondent's Disposal Practices

(DISPOSAL)	*Students*		*Parents*	
	M	VI	M	VI
I throw and left my garbage anywhere.	1.72	N	1.33	N
I burn waste materials	1.84	N	1.91	N
I throw waste materials in common open dumps.	2.04	S	1.93	N
I dispose biodegradable wastes into a compost pit	2.39	S	2.55	S
I dispose hazardous/toxic/special wastes such as laboratory leftover (chemicals) or electronic waste in any garbage container.	2.07	N	1.93	N
Composite Mean	2.01	S	1.93	N

This table displayed about the Respondent's Recycle Practices on Solid Waste Management. This table presents that both of the respondents were seldom practice the recycling of wastes. They both shows that they never ignore the importance of recycling and they both convert or design waste materials into a new product; (Begum,2009) that recycling was the common practice for disposal.

This table also exhibits about the Respondent's Disposal Practices on Solid Waste Management. It shows that the parents never disregard the disposal practice on solid waste management while the pupils seldom practice disposing their wastes properly. Both of the respondents never burn their waste materials and they both seldom disposing biodegradable waste into a compost pit.

Source reduction, reuse and recycling measures, frequency of waste collection, staff participation in training programs and waste disposal method are factors to affect attitude towards SWM (Begum et al., 2009).

Majority of the student-respondents disclosed unselectively disposal of food scraps, yard trimmings, and plastics with other the types of household wastes. Meanwhile, papers, glass, and metal wastes were predominantly recycled/ reused or sold to junkshops. (Barloa,2016)

Table 3 The Relationship of Awareness and Practice on Solid Waste Management of the Respondents

Variables	*Pearson r*	*Computed t-value*	*Tabular value*	*Interpretation*
Awareness and of Practices on SWM	0.47	9.28	1.96	Significant

Since the computed t value which is 9.28 is greater than the tabular value which is 1.96, the data shows that there is a significant relationship between the awareness and practice on solid waste management among the respondents.

The findings of the present study have made it clear that they are well aware of the importance of waste management. But they are lacking in the practice of proper waste management. This study findings support the studies conducted by Ifegbesan (2008).

CONCLUSIONS

The following were the conclusions derived from the findings of the study.

1. There were more female than male respondents. Majority of the parents were college graduate. Most of the parents were associated with the private sectors.
2. Both the respondents are aware of the solid waste management. Both of the students and parents seldom practice the segregation process in waste management. The respondents often reduce their wastes. Parents often practice the reusing of materials while the students seldom practice the reuse of reusable materials. Both of the respondents seldom practice the recycling of wastes. Parents never disregard the disposal practice on solid waste management while the pupils seldom practice disposing their wastes properly
3. The awareness on solid waste management of the respondents is significantly related to their practices.

RECOMMENDATIONS

The discussion above leads to the following recommendations

1. Since there is a low awareness result of the students and parents on awareness on waste segregation, reduce, reuse an orientation on RA 9003 also known as the Ecological Waste Management Act of 2000 is highly recommended to be included in the action plan of the school administration.
2. It is also recommended that the segregation process should be taught in school and strictly be implemented.
3. For the future researchers, a continuous research on the effectiveness of the orientation and strict implementation of RA 9003 in school and at home is recommended.

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LEADERSHIP STYLE, ORGANIZATIONAL CULTURE, AND TEACHER EFFICACY OF STATE UNIVERSITIES AND COLLEGES IN REGION IV-B

Maricris M. Usita, Ed.D.
Assistant Professor III, CAST-Dean
College of Arts, Sciences, and Technology
Occidental Mindoro State College
San Jose, Occidental Mindoro

ABSTRACT

Leadership style is categorized into three transformational, transactional, and servant. As perceived by the two groups of respondents, the dominant leadership style of schools administrators of State Universities and Colleges in MIMAROPA was transformational. The school administrators and faculty members possess a high ($\bar{x}$=4.38) level of school culture acceptability practices on administrative support, professional development, community involvement, and faculty involvement. The components of teacher's efficacy of State Universities and Colleges were evaluated as very high ($\bar{x}$=4.52) and motivational strategies is the main focus of SUCs in MIMAROPA. The leadership style of school administrators indicates a moderate relationship based on the multiple correlation coefficient of 0.56 indicating that approximately 31.84% (r2=0.3184) of the variance of the organizational culture could be accounted for by the linear combination of transformational, transactional, and servant leadership style. Teacher's efficacy obtained multiple correlation coefficient of 0.60 which specifies a moderate relationship shows that approximately 36.14% (r2=0.3614) of the variance of the teacher's efficacy could be accounted for by the linear combination of administrative support, teacher involvement, professional development and community involvement.

Keywords: transformational, transactional, servant, organizational culture, teacher's efficacy

INTRODUCTION

The educational system is highly demanding which made the teaching profession very challenging. Teachers are expected to perform well and make a difference. Effective teachers are essential for the accomplishment of every school's vision, mission, goals and objectives.

As quoted from Hawkins & Wagner (2008), "No matter how remarkable the reform design for a school, nothing will take hold until the culture is right. Programs will not improve until people improve." In order for a school to have a long-lasting success, there is a need to build and shape first the culture that serves as its foundation. The challenge, therefore, for the school administrators is to stimulate their faculty members' creativity and tolerance for change.

Administrators and teachers play a crucial role in the achievement of success for school change and it should be embedded in the culture of the organization. No schools are exactly the same because school cultures are unique. As stated by Fullan (2009), the key to achieve change is "purposeful peer interaction" in which works best when the broader values of the school and those individuals and groups mesh, when information and knowledge are shared openly, and when monitoring mechanisms are installed to detect ineffective actions and identify effective practices.

Moreover, school administrators set the organizational culture depending on their leadership practices. Wagner (2006) described "organizational" culture as shared experiences both in and out of school (traditions and celebrations), a sense of community, and of family and team.

The need to make careful study of the teacher efficacy has to be done taking into consideration organizational culture and the kind of leadership style of the people behind the school programs.

Schools need to plan properly their professional development program for teachers to improve learning for students and improve school system. Thus, teachers' performance will be enhanced if proper culture is practiced. Moreover, collaboration helps to build trust between teachers within a school. Trust is an important factor in developing effective schools.

As of today, many school administrators face and see challenges as their worse constant companion. In keeping track with school development and success, administrators have a lot of responsibilities and accountabilities over its smooth operations. The effectiveness of schools depends on the great extent of effectiveness of the administrators and teachers who are responsible for conducting school activities.

It is in the belief of the researcher that many teachers and administrators have not realized how their performance impacts a high quality educational environment. Ultimately, the success or failure of an institution depends on the teacher's effectiveness and quality of leadership due to fast changing environment that needs high quality of decision making (Graber & Kilpatrick, 2008). The administrator's leadership style and organizational culture set the tone for the teacher effectiveness which in turn lead to school empowerment and student development. The culture and success of employees are often influenced by the values of the leaders of the organization. Successful leaders are considered to possess strong or inspiring values.

This study gives insights on the different leadership style that provides better ways of manning an institution. Pointers that can be generated from the findings of the study may contribute to the harmonious relationship between school administrators and faculty members. Additionally, the study could help the school embrace change, support teachers' growth, and enhance teacher's efficacy to establish a positive organizational culture for the administrators, faculty and students.

OBJECTIVES

The main purpose of the study is to determine the leadership style, organizational culture, and teacher efficacy of State Universities and Colleges (SUCs) in Region IV-B.

Specifically, this study sought to answer the following questions:

1. Determine the extent of leadership style of the school administrators of SUCs in MIMAROPA in terms of:
   - transformational leadership;
   - transactional leadership; and
   - servant leadership.
2. Determine the level of acceptability of organizational culture practices of SUCs in MIMAROPA in terms of the following indicators:
   - administrative support;
   - faculty involvement;
   - professional development; and
   - community involvement.
3. Determine the level of teachers efficacy of SUCs in MIMAROPA in terms of:
   - classroom management;
   - student engagement;
   - instructional strategies; and
   - motivational strategies.
4. Determine if there exists significant relationship between the extent of leadership style and the level of organizational culture practices as perceived by the school administrators and faculty members.
5. Determine if there exists significant relationship between the level of organizational culture and the level of teachers efficacy as perceived by the school administrators and faculty members.

METHODOLOGY

The descriptive–correlational-comparative method of research was used in this study. Descriptive-correlational design involves collecting data in order to determine whether, and to what degree, a relationship exists. To describe the leadership style, organizational culture and teacher efficacy, the study employed descriptive survey method. To determine the relationship between and among the variables, the correlational approach was used to test the independent and dependent variables.

A total of 123 school administrators and 210 regular faculty members of the State Universities and Colleges in Region IV – B within MIMAROPA (Mindoro, Marinduque, Romblon and Palawan) area are the subjects of the study. They were chosen using proportional stratified random sampling.

A self-prepared questionnaire with three (3) major parts served as the data-gathering instru-

ment in this study. Part I covered the leadership styles of school administrators and classifies as transformational, transactional and servant leadership style. Part II referred to the level of organizational culture and the survey questionnaires measured teachers' perceptions of the following four factors that underlie the construct of school culture such as administrative support, teacher involvement, professional development and community involvement. Part III covers the Teacher efficacy it was used to assess the level of efficacy of the college faculty. The reliability of the instrument was determined using the test and re-test method. The researcher-made instrument underwent the process of validation to ascertain its objectivity. The statistical tools used to interpret the data were weighted mean, and multiple linear regression.

FINDINGS

Extent of leadership style of the school administrators of SUCs in MIMAROPA

Table 1 shows the mean perceptions on the extent of leadership style of the school administrators of State Universities and Colleges (SUCs) in MIMAROPA in terms of leadership style. Leadership style is categorized into three transformational, transactional, and servant. As perceived by the two groups of respondents, transformational leadership style got the highest rank with a mean score of 4.27 interpreted as high extent. Results indicate that the idealized influence, inspirational motivation, and intellectual stimulation is considered the top priority of respondents in classifying the type of leadership their administrators. This is in accordance with the rating of school administrators that obtained a mean score of 4.27 while the evaluation of the faculty members obtained the mean score of 4.13 and both perceived as high.

Servant style of leadership obtained the mean score of 4.20 in which empowering others, visionary, and humility. These influenced both the faculty and administrators to have a shared vision that guides the institution to attain its full potential. On the other hand, transactional leadership style obtained the lowest mean score of 4.13 in which leaders assign tasks that will allow the faculty to accomplish the mission and likewise motivated due to reward provided based from their performance.

Results imply that school administrators of SUCs manifested transformational leadership style that encourages collaboration, develops a shared decision making, understands change that leads to empowerment and enhanced professionalism. The transformational leaders concentrate on continuing school improvement that create an environment that help one another to work for the improvement and betterment of their institution. This was supported by the study conducted by Warrilow (2012) which claims that transformational leadership theory is all about leadership that creates positive change in the followers whereby they take care of each other's interests and act in the interests of the group as a whole.

Table 1. Extent of leadership style of the school administrators of SUCs in MIMAROPA

Leadership Style	School Administrators Mean	Faculty Members Mean	Overall Mean	Rank	Description
1. Transformational	4.33	4.21	4.27	1	High Extent
2. Transactional	4.21	4.05	4.13	3	High Extent
3. Servant	4.26	4.14	4.20	2	High Extent
Overall Mean	**4.27**	**4.13**	**4.20**		**High Extent**

Level of acceptability of organizational culture practices of SUCs in MIMAROPA

As shown on Table 2, school administrators perceived that their school culture acceptability practices is high, as revealed by the overall mean of 4.38. Administrative support received the highest overall mean of 4.46 described as high, which shows that the administrators and faculty value the extended help provided by the school administrators to achieve the culture of excellence. Data revealed a big difference between the result of evaluation between the school administrators and faculty member's respondents. The overall mean of 4.55 which is interpreted as "very high" shows that administrators provide its best ability to help faculty in relation to school policies and implementation. Meanwhile, the overall mean of 4.36 was obtained from the evaluation of faculty respondents. This implies that school administrators supervise all school programs, activities, plans, and projects in conformity with school rules and regulations followed and implemented by faculty members. They support, trust, and involve faculty and staff in decision-making processes to carry out responsibilities in order to facilitate healthy working relationships among faculty.

As shown, faculty involvement is considered high as a result of the mean score obtained from the evaluation of administrators and faculty with an overall mean score of 4.29 and 4.34 respectively. Results imply that faculty involvement as part of the element of school culture describes the degree to which faculty members work together to achieve the mission of the school because the level of competencies of school depends largely on faculty involvement, partnership and cooperation between school administrators and faculty members for school growth and development. This involves active collaboration in all school – related activities, share, and appreciate dialogue about teaching and learning and support sharing of ideas within members of the school. They treat each other with courtesy and respect as professionals and as individuals; and they receive professional and/or personal support from administrators and staff whenever there is a problem.

The overall mean of 4.37 and 4.44 are both interpreted as high for administrators and faculty mebers respectively. Professional development is an important factor that needs to be considered by both the administrators and faculty in achieving the vision, mission, and goals of the institution. Results imply that State Universities and Colleges (SUCs) in MIMAROPA have high qualities of professional development. It dealt with the degree to which faculty members and school administrators value continuous professional and personal development for school-wide improvement. Faculty members remain knowledgeable about the current educational issues and they effectively participate in workshops, seminars, and trainings.

The community involvement got an average mean score of 4.33 since extension service program is one of the mandates of SUCs. The faculty involvement obtained the mean score of 4.32 described as high and the least among the items. The school administrators, faculty, staff, students, and parents maintain effective community relations among each other and with other private and local agencies and organizations within the area. Exposures to different community outreach program, extension service program and research endeavors provide exposure for students, faculty, and administrators that lead to get support and cooperation of parents, local officials, and other partner agencies/organizations in implementing major school projects and programs.

Collectively, the level of school culture of the respondents was perceived as high. This implies that the assessment of both the school administrators and faculty members developed strong relationships, attitudes, values, and practices that are being shaped through interaction of administrators, faculty, staff, students, and the community that influence school functions and performance.

Table 2. Level of acceptability of organizational culture practices of SUCs in MIMAROPA

Organizational Culture	School Administrators Mean	Faculty Members Mean	Overall Mean	Rank	Description
1. Administrative Support	4.55	4.36	**4.46**	1	High
2. Faculty Involvement	4.29	4.34	**4.32**	4	High
3. Professional Development	4.37	4.44	**4.41**	2	High
4. Community Involvement	4.22	4.43	**4.33**	3	High
Overall Mean	**4.36**	**4.39**	**4.38**		**High**

Level of teacher's efficacy of SUCs in MIMAROPA

Table 3 shows the mean perception on the level of teacher's efficacy of SUCs in MIMAROPA. Generally, the four components obtained a grand mean of 4.52 indicating that all the components were "very high". This findings suggest that faculty members of State Universities and Colleges demonstrate commitment on their work. The motivational strategies got the highest mean of 4.57 which serve as potential and strength of the respondents to develop students positive behavior. The evaluation of both the administrators and faculty respondents shows that motivational strategies played a vital role in teacher efficacy to help students to be well-rounded individuals. Result implies that there is a high ability for both the respondents to manage behavior and maintain a positive classroom environment that allows students to be successful; encourages students to study hard and value learning and as teachers they provide appropriate challenges to develop high expectations to students that lead to the development of positive behavior.

Findings revealed that faculty is more committed and dedicated than school administrators in terms of instructional strategies based on the result. An overall mean of 4.48 for school administrators and interpreted as high. While, faculty member respondents obtained a mean score of 4.55 and interpreted as very high. The study implies that respondents positively affects students' learning and quality of teaching using variety of assessment and instructional methods to control undesirable classroom behavior of students. Faculty provides an alternative explanation or exam-

ple when students are confused for them to easily understand the lessons.

The classroom management and student engagement got the least mean of 4.51, showing the techniques used to prevent disruptive behavior of students inside the classroom. Overall means of 4.47 and 4.55 show that school administrators and faculty respectively are both dedicated to their vocation to provide quality education to the students. Findings show that the capabilities of faculty is flexible that they have the ability to manage and control students that are very difficult to manage to develop their performance and learning outcome.

The overall mean of 4.48 and 4.53 signifies that administrators and faculty members respectively performed their role as educator to handle and understand student's behaviors and attitudes; and to address the concerns of the students in order to maintain good classroom working condition. This study implies that the school administrators and faculty have a high level of beliefs that in classrooms, if well-managed by teachers, can become places of freedom to learn and can provide safety for students. As faculty, they handle disciplinary problems with fairness and understanding in which they can incorporate various techniques to prevent disruptive behavior in classrooms as well as the methods used to motivate students.

Table 3. Level of teacher's efficacy of SUCs in MIMAROPA

Teachers Efficacy	School Administrators Mean	Faculty Members Mean	Overall Mean	Rank	Description
1. Classroom Management	4.48	4.53	**4.51**	3.5	Very High
2. Student Engagement	4.47	4.55	**4.51**	3.5	Very High
3. Instructional Strategies	4.48	4.55	**4.52**	2	Very High
4. Motivational Strategies	4.55	4.58	**4.57**	1	Very High
Overall Mean	**4.50**	**4.55**	**4.52**		**Very High**

Relationship between the extent of leadership style and the level of organizational culture practices as perceived by the school administrators and faculty members

Table 4 presents the results of the organizational culture practices of State Universities and Colleges found that the transformational, transactional and servant leadership style were necessary to predict organizational culture practices. The multiple correlation coefficient was 0.56 which specifies a moderate relationship, indicating that approximately 31.84% (r2=0.3184) of the variance of the organizational culture could be accounted for by the linear combination of transformational, transactional and servant leadership style. The variations in scores show how the values for transformational, transactional, and servant leadership style could be attributed to the variations in their organizational culture. The transactional leadership style obtained a beta coefficient of 0.257 strongest predictor of independent variable. While the remaining 68.16% denoted for servant leadership style since it obtained a beta coefficient of 0.144 and a minimal amount of percentage for transformational leadership style due to its beta coefficient of 0.086.

The linear combination of transformational, transactional and servant leadership style, F ((3,331)=51.54, $p < .005$). Therefore, the null hypothesis is rejected. The result indicates a moderate relationship between the transformational, transactional and servant leadership style and organizational culture practices. Leadership and culture are attached to each other although in order to be an effective leader it requires supportive culture. Therefore, there is significant relationship obtained from transformational, transactional and servant leadership style and organizational culture practices. This was supported by the study of Mees (2008) which revealed that transformational leadership and school culture are intercorrelated. It was reported that a school without a collaborative culture would not accomplish high levels of learning.

Table 4. Multiple stepwise regression analysis between the extent of leadership style and the level of organizational culture practices as perceived by the school administrators and faculty members

Independent Variable	Dependent Variable	Multiple R	R^2	Beta Coefficient	F
Transformational	Organizational culture	0.56	31.84 %	0.086	51.54
Transactional				0.257	
Servant				0.144	

Relationship between the level of organizational culture practices and the level of teacher efficacy as perceived by the school administrators and faculty members

Table 5 could be predicted well by their administrative support, teacher involvement, professional development and community involvement. The multiple correlation coefficient was 0.60 which specifies a moderate relationship, indicat-

ing that approximately 36.14% (r2=0.3614) of the variance of the teacher's efficacy could be accounted for by the linear combination of administrative support, teacher involvement, professional development, and community involvement.

The teacher's involvement obtained a beta coefficient of 0.239 serves as strongest predictor of independent variable. It was followed by administrative support which obtained 0.127 and a minimal amount of percentage for community involvement (0.110) and professional development (0.091). The linear combination of administrative support, teacher involvement, professional development and community involvement obtained a significant value of F((4,330)=46.69, p < .005) rejects the null hypothesis.

The findings indicate that the administrative support, teacher involvement, professional development and community involvement of both the administrators and the faculty intrinsically contribute a bigger part in the level of teacher efficacy and commitment. Results imply that the school culture practices of the respondents in terms of administrative support, teacher collaboration, professional development and community involvement are significantly related to the level of their teacher's efficacy.

Table 5 Multiple stepwise regression analysis between the level of organizational culture practices and the level of teacher efficacy as perceived by the school administrators and faculty members

Independent Variable	Dependent Variable	Multiple R	R^2	Beta Coefficient	F
Administrative Support	Teacher Efficacy	0.601	36.14 %	0.127	46.69
Teacher Involvement				0.239	
Professional Development				0.091	
Community Involvement				0.110	

CONCLUSIONS

The following are the conclusions derived from the findings of the study.

1. The dominant leadership style of schools administrators of State Universities and Colleges in MIMAROPA was transformational.
2. The school administrators and faculty members possess a high level of school culture acceptability practices on administrative support, professional development, community involvement, and faculty involvement.
3. The components of teacher's efficacy of State Universities and Colleges were evaluated as very high and motivational strategies is the main focus of SUCs in MIMAROPA.
4. The leadership style of school administrators indicates a moderate relationship with organizational culture practices.
5. Teacher's involvement is the strongest predictor of organizational culture and teacher's efficacy.

RECOMMENDATIONS

Based on the findings and conclusions drawn, the researcher recommends the following.

1. School administrators should encourage participative decision making in planning for the exchange of ideas and in building a stronger organization.
2. Administrators should exercise a leadership style that supports, involves, and creates an open communication and linkages on learning partnerships to have involvement in educational process.
3. A regular evaluation of teacher's efficacy and school culture should be conducted by school administrators to evaluate the needs of the institution.
4. Administrators should effectively implement sustainable programs that continuously assess the attainment of the mission, vision, and goals of their respective schools.

ACKNOWLEDGMENT

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EMPLOYER'S FEEDBACK: A TOOL IN ENHANCING EMPLOYABILITY SKILLS OF NEW IT GRADUATES

Marites D. Escultor, MSIT
Instructor II, OMSC - IT Department
San Jose, Occidental Mindoro, Philippines

ABSTRACT

Employer's expect graduates to have technical and discipline competences from their degrees and to demonstrate a range of broader skills and attributes that include team-working, communication, leadership, critical thinking, problem solving and managerial abilities. Graduates of Information Technology department of Occidental Mindoro State College is equipped with necessary skills and competencies as they graduated from their course. As these graduates landed a job, a feedback from their employer is important enough to both assess their performance and to know what are the skills needed by the employer to make them employed. The study devoted in gathering feedback from the employer of the IT graduates from 2013-2017. Feedback form was sent to identified employers both on the public and private agencies.The results indicate that the skills of IT graduates are commendable. An outstanding rate was given by the employer on the overall performance of IT graduates they hire. The conclusion was clear in showing that the employer was satisfied with the performance of IT graduates. Attitude, skills, and interest in work are the common skills that an IT graduate should have to be employed. The researcher found it difficult to retrieve data from outside the province,thus, it is recommended that a longer time should be devoted to this study to give longer time also for the employer to answer the feedback form.

Keywords: Problem Solving ability, College Algebra, Predictor, attitudes toward mathematics, general skills.

INTRODUCTION

The employment rate in the Philippines has hit a record low in July, 2017. According to the latest Labor Force Survey (LFS) conducted by the Philippine Statistics Authority (PSA), the figure has gone down to 94.4% from 94.6% during the same period last year. That gives us an unemployment rate of 5.6%, the second lowest among all the July employment numbers since 2006 which means that there were more than 2 million jobless people all over the country.

The educational sectors in the Philippines play a vital role in the economic, social and cultural advancement of the country and were recognized to bring development on the human capital as they were expected to prepare graduates for employment. According Butler (2003), the quality of education provided by higher education institutions may affect the quality the employability of its graduates.

Occidental Mindoro State College, being the only state college in the province, ensures that quality education is delivered among its clientele by enhancing its curriculum and improving the quality of instruction. One of the efforts is subjecting its programs for accreditation. The Bachelor of Science in Information Technology, having the highest number of enrollees in the main campus, have undergone level 3 phase 1 accreditation visit of which one significant factor that supports quality of instruction is the employment rate of its graduates. Thus, the department experienced pressure to enhance its curriculum which is a complex process that demands many things and among them is the involvement of different stakeholders.

One of these stakeholders whose inputs are sought are the employers and local industry partners of the institution like TESDA, DOLE, DOST and LGU of San Jose. One of which is to gather their feedback of IT graduates they employed. Through this effort, the department is guided in enhancing its curriculum and estimating how it performs against the standard it sets in consideration of the legal and educational mandates.

According to Singh and Choo (2012), employer's feedback can generate evidence on the quality of graduates, their capabilities and perfor-

mance in the school and is usually reported as the employers' level of satisfaction of the graduates. Further, it can provide information on competencies and qualities they considered very important and useful in the work place.

The employment rate of BSIT graduates was determined by a continues study on its employability although, the number of respondents were limited and usually comprise only half of the total population of the graduates. The study of Magararu (2015), showed a limited number of respondents, out of 540 graduates from 2011-2013 only 270 were traced to have employment. However, the employer's feedback of these employed graduates can served as a good input for the improvement of the curriculum and the delivery of instructions among IT students.

This study conducted an assessment of employer's feedback of IT graduates from 2013 to 2017. Through this, the department was given baseline information about the quality of its graduates and the requirements of employers, which may prove indispensable in enhancing the curriculum of the program and for IT graduates to have better opportunities for employment.

OBJECTIVES OF THE STUDY

The study aims to investigate the performance of IT graduates of Occidental Mindoro State College from 2013 to 2017 through the feedback given by their employer. Specifically, the study aims to:

1. Assess the performance of the IT graduates in their employment;
2. Determine the satisfaction rating of employers of IT graduates; and
3. Determine the employer's perception of the employability skills of IT graduates

CONCEPTUAL FRAMEWORK

The research paradigm that guided the study is illustrated in Figure 1 below. Using the BSIT curriculum and graduates skills and competencies as inputs in the development of feedback form, the employers will rate the performance of IT graduates and give their perceptions on the employability skills of IT graduates. The feedback will be assessed and will be use in crafting the BSIT curriculum and in enhancing the skills and competencies of IT students.

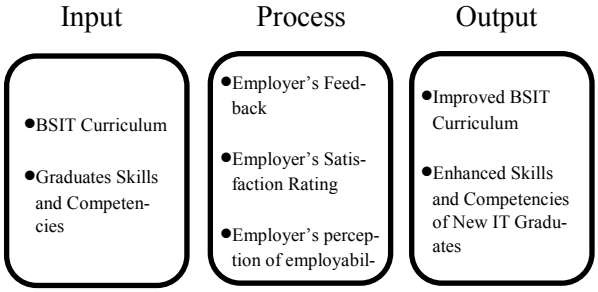

Fig.1. Research Paradigm.

METHODOLOGY

Research Design

The study used the descriptive survey method of research employing a survey questionnaire, a feedback form, to collect the data needed.

Time and Place of the Study

This study was conducted in March – June 2018 at the identified local industry partners like TESDA, DOLE, DOST, NGU's, and LGU's of San Jose, Occidental Mindoro.

Data Gathering

A feedback form was the main instrument that will be used in gathering data for the study. A self-made feedback form was validated to ensure that it could address the proposed objectives in the study. After which, it was administered to the respondents upon approval of the respective officials or employers. The researcher personally administer the survey on selected local industry partners to expedite data collection. Sending the feedback form through email was also considered.

Respondents and Sampling

The participants of the study was the employer of the employed IT graduates from 2013-2017. Table 1 showed that there were 745 total population of graduates of OMSC – BSIT program from 2013 -2017.

Table1. IT graduates from 2013-2017

Year	Total Number of Gradu-
2013-2014	131
2014-2015	190
2015-2016	230
2016-2017	194
Total	**745**

The respondents of the study are the 57 employers of in the locality.

Data Analysis

The data was analyzed using descriptive statistics such as weighted mean and percentage.

The feedback of each respondents/employers was listed and tabulated according to the number instances that the feedback was given.

RESULTS AND DISCUSSIONS

There were a total of 57 employers who served as the respondents of the study. There were 15 respondents from the government/ public agencies, 26 from private and business sectors, 5 from educational institutions, 5 from micro corporations, and 6 from banks.

The response of employer according to the criteria ability to learn was summarized in table 3. It was found that the ability to learn the job of IT graduates was commendable with the weighted mean of 4.42. As the change in technology rapidly seen, IT graduates were able to adjust and adopt themselves to a new job.

Table 3. Respondents Rating on the criteria Ability to Learn

Criteria	Mean	Qualitative Inter-
Ask pertinent and purposeful questions	4.50	Commendable
Seeks out and utilizes appropriate resources	4.13	Commendable
Accepts responsibility for mistakes and learn from experiences	4.63	Exceptional
Weighted Mean	**4.42**	**Commendable**

Table 4 shows the qualitative interpretation of respondents rating on the criteria Reading/ Writing/ Computation Skills. A weighted mean of 4.42, indicates that the reading/writing/ computation skills of IT graduates was commendable. This means that these skills were mastered by the IT graduates as it was clearly set their curriculum as a major subject.

Table 4. Respondents Rating on the criteria Reading/Writing/Computation Skills

Criteria	Mean	Qualitative Interpretation
Read/ comprehends/follows written materials	4.50	Commendable
Communicates ideas and concepts clearly in writing	4.38	Commendable
Works with mathematical procedures appropriate to the job	4.38	Commendable
Weighted Mean	**4.42**	**Commendable**

Table 5 shows the qualitative interpretation of respondents rating on the criteria Listening and Oral Communication Skills. A weighted mean of 4.27, indicates that the listening and oral communication skills of IT graduates are commendable. This indicates that IT graduates are good communicators.

Table 5. Respondents Rating on the criteria Listening and Oral Communication Skills.

Criteria	Mean	Qualitative Interpretation
Listen to others in an active and attentive manner	4.25	Commendable
Effectively participates in meetings or group settings	4.19	Commendable
Demonstrated effective verbal communication skills	4.38	Commendable
Weighted Mean	**4.27**	**Commendable**

Table 6 shows the qualitative interpretation of respondents rating on the criteria Creative Thinking and Problem Solving Skills. A weighted mean of 4.33, indicates that the creative thinking and problem solving skills of IT graduates was commendable. It indicates also that they are problem solver.

Table 6. Respondents Rating on the criteria Creative Thinking and Problem Solving Skills

Criteria	Mean	Qualitative Interpretation
Breaks down complex tasks/ problems into manageable pieces	4.38	Commendable
Brainstorm/develops options and ideas	4.50	Commendable
Demonstrated an analytical capacity	4.13	Commendable
Weighted Mean	**4.33**	**Commendable**

Table 7 shows the qualitative interpretation of respondents rating on the criteria Professional and Career Development Skills. A weighted mean of 4.40, indicates that the career development skills of IT graduates was commendable. It also indicates that they practice professionalism at work

Table 7. Respondents Rating on the criteria Professional and Career Development Skills

Criteria	Mean	Qualitative Interpretation
Exhibits self-motivated approach to work	4.75	Exceptional
Demonstrated ability to set appropriate priorities/ goals	4.19	Commendable
Exhibits professional behavior and attitude	4.25	Commendable
Weighted Mean	**4.40**	**Commendable**

Table 8 shows the qualitative interpretation of respondents rating on the criteria Interpersonal and Teamwork Skills. A weighted mean of 4.58, indicates that the interpersonal and teamwork skills of IT graduates was exceptional. This indicates that they are willing to work in a team.

Table 8. Respondents Rating on the criteria Interpersonal and Teamwork Skills

Criteria	Mean	Qualitative Interpretation
Manages and resolves conflicts in an effective manner	4.50	Commendable
Supports and contributes to a team atmosphere	4.63	Exceptional
Demonstrated assertive but appropriate behavior	4.63	Exceptional
Weighted Mean	**4.58**	**Exceptional**

Table 9 shows the qualitative interpretation of respondents rating on the criteria Organizational Effectiveness Skills. A weighted mean of 4.33, indicates that the organizational effectiveness skills of IT graduates was commendable. This means that they are effective employees.

Table 9. Respondents Rating on the criteria Organizational Effectiveness Skills.

Criteria	Mean	Qualitative Interpretation
Seeks to understand and support the organization's mission/ goals	4.13	Commendable
Fits in with the norms and expectations of the organization	4.50	Commendable
Works with appropriate authority and decision making channels	4.38	Commendable
Weighted Mean	**4.33**	**Commendable**

Table 10 shows the qualitative interpretation of respondents rating on the criteria Basic Work Habits. A weighted mean of 4.08, indicates that the basic work habits of IT graduates was commendable. This means that IT graduates possess positive behavior towards work.

Table 10. Respondents Rating on the criteria Basic Work Habits.

Criteria	Mean	Qualitative Interpretation
Reports to work as scheduled and on-time	4.13	Commendable
Exhibits a positive and constructive attitude	4.00	Commendable
Dress and appearance are appropriate for this organization	4.13	Commendable
Weighted Mean	**4.08**	**Commendable**

Table 11 shows the qualitative interpretation of respondents rating on the criteria Character Attributes. A weighted mean of 4.27, indicates that the character attributes of IT graduates was commendable.

Table 11. Respondents Rating on the criteria Character Attributes.

Criteria	Mean	Qualitative Interpretation
Brings a sense of values and integrity to the job	4.06	Commendable
Behaves in ethical manner	4.25	Commendable
Respects the diversity (religious/cultural) of co-workers	4.50	Commendable
Weighted Mean	**4.27**	**Commendable**

Table 12 shows the Summary of all the criteria for Skills of IT graduates. A grand mean of 4.34 was accumulated which indicates that the skills of IT graduates were commendable.

Table 12. Summary of Respondents Rating

Criteria	Mean	Qualitative Interpretation
Ability to learn	4.42	Commendable
Reading/Writing/Computation skills	4.42	Commendable
Listening and Oral Communication Skills	4.27	Commendable
Creative Thinking and Problem Solving Skills	4.33	Commendable
Professional and Career Development Skills	4.40	Commendable
Interpersonal and Teamwork Skills	4.58	Exceptional
Organizational Effectiveness skills	4.33	Commendable
Basic Work Habits	4.08	Commendable
Character Attributes	4.27	Commendable
Weighted Mean	**4.34**	**Commendable**

There were skills identified by the employers that will help an IT graduate employed in a job specifically in IT industries.

Table 13. Employability Skills that an employer require to an IT applicant

Rank	Skills
1	Attitude towards work.
2	Interest in work.
3	Office/computer skills
4	Programming skills
5	Hardware servicing skill
6	Troubleshooting skills
7	Communication skills (English)

The employers were asked to rate the overall performance of the IT graduates they hired using

the range of 1-10. A weighted mean of 9.125 was gained indicating that the overall performance of IT graduates is Outstanding. This also indicates that the employer was satisfied with the performance of the IT graduates they hired.

CONCLUSIONS

Effective feedback has benefits for the giver, the receiver, and the wider organization. The graduates of Information Technology department possessed both the technical and non-technical skills that make them land a job. Feedback from employers are important enough in enhancing the skills of IT graduates.

Based on the findings of the study the following conclusions were derived:

1. The performance in job of IT graduates were commendable and rated the outstanding by the employers.
2. Employers are satisfied with the performance of IT graduates they hired.
3. Attitude, Skills and Interest in work are the commonly skills that make an IT graduates hireable.

RECOMMENDATIONS

The study is very limited to the locality of San Jose and some municipalities like Rizal, Calintaan, Sablayan and Mamburao. It was found difficult to retrieve data which was sent online. Thus, it is recommended that a longer time be devoted to this study in order to retrieve data from employers outside the province. A research on the preparedness of IT graduates in landing a job outside the province and the country in general is highly sought.

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DOMESTIC GRAY WATER DISPOSAL AND RECYCLING PRACTICES IN SAN JOSE, OCCIDENTAL MINDORO

Norma B. Muyot, ChE, Ed.D.
Occidental Mindoro State College
Associate Professor II
College of Architecture, Engineering and Technology

ABSTRACT

This study was conducted purposely to determine the household demographics of urban, rural, coastal and island barangays and their gray water disposal and recycling practices in San Jose, Occidental Mindoro. This also endeavoured to find out if significant relationship exists between the demographic variables and the gray water disposal and recycling practices of households in the selected barangays. Further, it also determined if the gray water disposal and recycling practices differed significantly across barangays. There were 30 respondents per barangay or a total of 120 respondents. A structured questionnaire was used to gather data and where possible, focus group discussions were conducted with the respondents to validate their answers.
Results of the study revealed that the heads of households were middle aged and were literate having finished high school.. The respondents lived just above the poverty level, were medium sized and had access to potable water through artesian wells and jetmatic pumps. The household gray water disposal practices were: pouring to the drain connected to a septic tank, disposing directly to the ground, disposed by recycling, and disposal by throwing to a nearby body of water. The household gray water recycling practices include : used gray water to flush the toilet, in house cleaning, in cleaning pig pens and watering nearby plants. A positive correlation was found between the variables household size and household monthly income with gray water disposal practices. A direct relationship was found between gray water recycling practices and the variables educational attainment, household size household income and type or source of potable water.

Keywords: gray water disposal, domestic wastewater, gray water recycling

INTRODUCTION

Today, global population stands approximately 7.1 billion and is projected to reach 9.7 billion by 2050. Diseases caused by contaminated water and unhealthy sanitation practices cause over 10,000 deaths per day, including 5000 children under the age of five. Unclean, unsafe water and poor sanitation are not only the greatest human rights crises facing the world today but also the gravest health crisis (Pink, 2013) . Safely managed sanitation and safe wastewater treatment and reuse are fundamental to protect public health (WHO, 2013). Owing to its enormous construction and maintenance costs, the management of wastewater in many urban urban centers of developing countries through a centralized wastewater management approach is very difficult (Kamal, et. al, 2008). Often , untreated wastewater is directly discharged into adjacent natural water courses, causing a grave threat to both public health and the aquatic environment. A recent study published by the Water and Sanitation Program revealed that not only does the current situation in the Philippines demand urgent attention, it is imperative that measures be undertaken to prevent land and water pollution through the incessant and indiscriminate disposal of domestic gray water.

Gray water is the untreated household wastewater generated from kitchen sinks, bath tubs, and washing machines. Shower, sink and laundry water comprise 50-80% of domestic waste water. The mean per capita volume of gray water produced is 25-40 gallons per day (WHO, 2010)

Gray water contains impurities and microorganisms derived from household and personal cleaning activities. Because of the high potential of gray water to contain pathogenic microorganisms and other materials, it is considered by

health authorities to be a potentially infectious and polluting liquid waste material.

In developing counties like the Philippines, an estimated 300 million urban dwellers are reported as having no access to sanitation. Majority of those having limited or no access to sanitation facilities belong to low income families.Forget, 1992; Briscoe and Steer, 1993; Black, 1994;; Giles and Brown, 1997). Approximately two thirds of the population in the developing countries have no hygienic means of disposing of excreta and an even greater number lack adequate means of disposing of total wastewater (Sinnatamby, 1990; Niemczynowicz, 1996).

Addressing the escalating sanitation needs is a significant challenge facing communities worldwide. Where water access is improved in the absence of gray water management, environmental pollution and public health impacts can increase dramatically. (Carden , et al, 2007).

Data from the San Jose Municipal Health Office, Municipal Planning and Development Office and and the Municipal Engineer's Office revealed that there is still a widespread lack of gray water treatment and sanitation infrastructure development in the Municipality. Presently, no sewerage system exists hence gray water from domestic and commercial establishments are disposed of by the household or commercial owners using a number of methods. Sanitary inspectors from the San Jose Municipal Health Office disclosed that gray water is disposed of indiscriminately resulting to not only health hazards but also contributes significantly to soil and water pollution in areas near surface water. The purpose of this study is to provide baseline data on the gray water disposal and recycling practices in San Jose, Occidental Mindoro for future policy implications to regulate the indiscriminate disposal of gray water into the immediate environ which pollutes the environment.

OBJECTIVES

This paper has the following objectives:

1. Determine the profile of urban, rural, coastal households in terms of the following:
   a. Age of head of household;
   b. Educational attainment of the household head;
   c. Household size;
   d. Monthly income; and
   e. source of potable water
2. Determine the domestic gray water disposal practices of households in urban, rural, coastal and island barangays in San Jose, Occ. Mindoro;
3. Assess the relationship between the household profile variables and the domestic gray water disposal practices;
4. Find out the relationship between the profile variables and the graywater disposal practices of the households; and
5. Determine if the gray water disposal and practices vary significantly among the barangays sampled.

METHODOLOGY

Study Site

Four barangays were used as sampling sites, each representing the barangay classification in the municipality of San Jose, a first class municipality in the province of Occidental Mindoro, such as Ilin Proper (island), San Roque (coastal), Barangay Poblacion II (urban) and Murtha (rural).

Sampling Procedure

Representative barangays were chosen using fishbowl sampling while the respondents were identified using first, cluster sampling where residents were grouped according to sitio or purok, a hamlet or subdivision of a barrio in the Philippines and then quota sampling to get the number of respondents.

Data Gathering Procedure

A structured questionnaire was used to gather data on the demographics of each household which included the age and educational qualification of the head of the household, usually the one contributing the biggest portion of the household , the household size, household income and type of water supply. Gray water disposal and recycling practices data were collected using Part II of the questionnaire. Where possible, focus group discussion was also conducted to validate answers.

Data Analysis

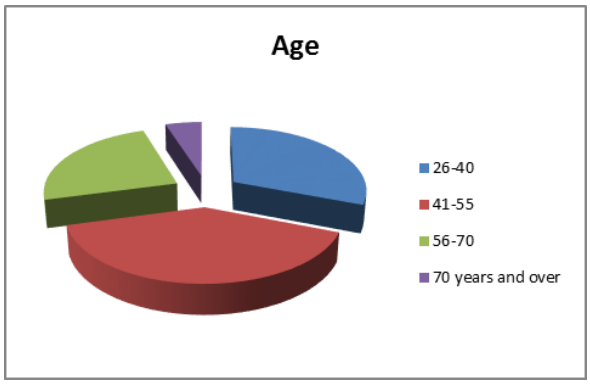
Frequency, mean and percentage were used to describe the demographics as well as the gray water disposal and recycling practices of the respondents. To determine the relationships between the profile variables and the gray water disposal and recycling practices, a correlation analysis using Pearson product moment correlation. To determine whether the water disposal and recycling practices significantly differs among the barangays, Analysis of variance was used.

RESULTS AND DISCUSSIONS

Profile of Respondents

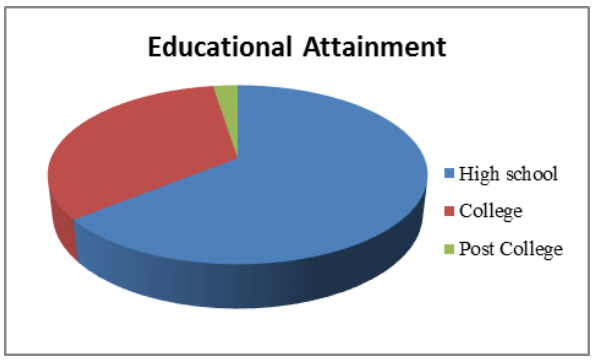
A total of 120 respondents were used as the data source in the study , 30 from each barangay. The profile of the respondents were as follows; in terms of age, 40% of the household heads belonged to the 41-55 age bracket while 37 or 30.83 % were in the age range of 26-40 years old, 29 or 24.17% had the age range of 56-70 years old and six or 5% of the household heads polled were 70 years and older.

Figure 1. Profile of the Respondents in terms of Age



In terms of educational attainment, or the highest degree the household head , majority (64.16%) were high school graduates while 33.33% finished college. The remaining 2.51% posted a degree higher than bachelor's.

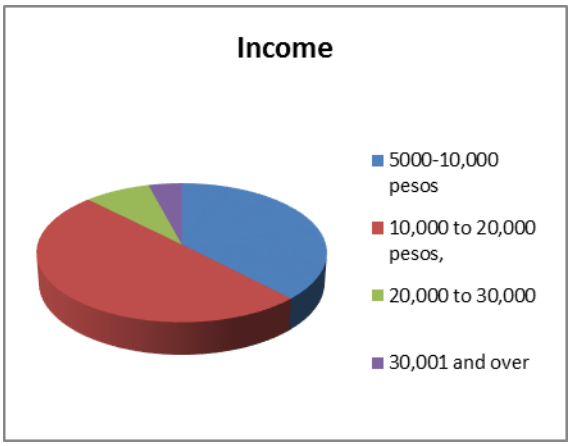
Figure 2. Profile of the respondents in terms of Educational attainment



Household Size and Income

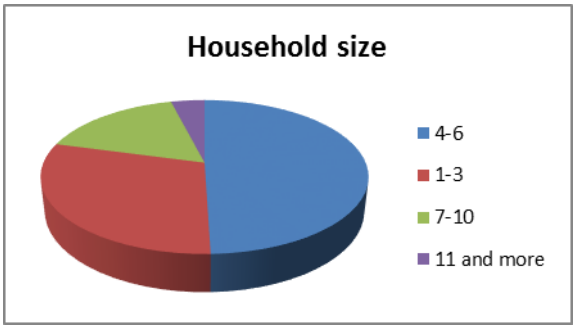
In terms of household income or the total monthly take home pay of the household members , 38 % or 45 of the respondents reported an income ranging from 5000-10,000 pesos, 60 or 50 had an income range of more than 10,000 to 20,000 pesos, 10 or 8.33 were earning more than 20,000 to 30,000 pesos, and the remaining 5 (4.17%) said they had income of more than 30,000 monthly. These data reveal that the biggest percentage of the respondents live just above the poverty level in Occidental Mindoro, which is pegged at P 16,169.00 per month as cited by the Philippine Statistics Office (Muyot, 2016).

Figure 3. Profile in terms of income



In terms of household size, 60 (50%) had a household size ranging from 4-6 members, 36 (30%) belonged to household having from 1-3 members, 20 (17%) had a big household size of from 7-10 members while 4 (3%) had 11 or more persons in the household. This finding indicate that the average household size in San Jose is medium consisting mostly of two parents and four children or immediate relative.

Figure 4. Profile of the respondents in terms of household size



Source of Potable water

In terms of source of potable water, 41% of the respondents said they get their water from an artesian well or jetmatic pump located within their

yards, 45 or 38 % have piped connections or are connected to either the San Jose Water District, or a water system within their house or community, the remaining 25 or 21% of the households get their water from other sources such as secondary connection to the local water utility , or in other local water sources such as communal faucets or artesian wells located away from their houses.

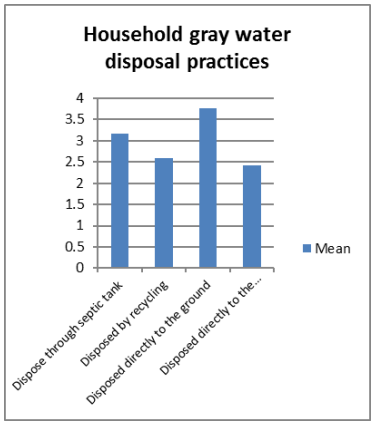
Table 1. Profile of respondents in terms of source of potable water

Type	Frequency	Percentage
Piped connection	45	37.50
Jetmatic/Artesian well	50	41.67
Other sources	25	20.83

Household gray water disposal practices

The households' gray water disposal practices include: disposal directly to the ground (mean=3.77) interpreted as ' 'often practiced' , pouring down the drain connected to a septic tank with a mean value of 3.17 interpreted as 'sometimes practiced', disposed by recycling either as raw gray water or underwent primary treatment such as straining and settling before being recycled, with a mean of 2.59 with an interpretation of 'sometimes practiced'. Dumping of graywater was also practiced with a mean of 2.41, interpreted as 'sometimes practiced'.

Figure 5. Household gray water disposal practices of the respondents

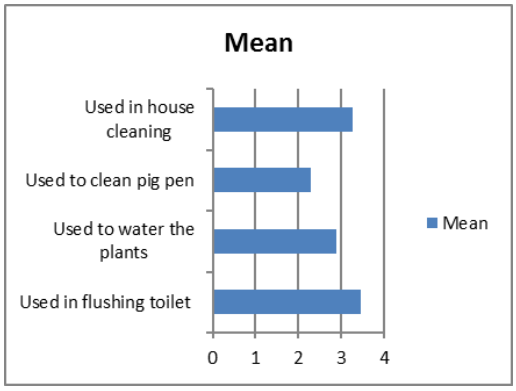


Legend: 4.2-5 always practiced, 3.3-4.1 -often practiced, 2.6-3.2-sometimes practiced, 1.9-2.5 seldom practiced 1-1.8 never practiced

Household gray water recycling practices

The gray water recycling practices of the households include re-using the gray water to flush the toilet (mean=3.45) interpreted as often practiced, watering the plants within the yard (sometimes practiced), using the gray water to clean the house (sometimes practiced) and used gray water to clean pig pen (seldom practiced. These findings indicate that the households rarely recycled their gray water.

Figure 6. Gray water recycling practices of the respondents



Legend: 4.2-5 always practiced, 3.3-4.1 -often practiced, 2.6-3.2-sometimes practiced, 1.9-2.5 seldom practiced 1-1.8 never practiced

Correlation between the profile variables and the graywater disposal and recycling practices

In determining the relationship between the profile variables and the gray water disposal practices of the households, a highly significant relationship was found between the variable household size (p=0.00) and gray water disposal practices. A significant relationship was also posted between the total household monthly income and the household's gray water disposal practices. (table 6).

The statistical analysis also found a significant correlation between the demographic variables educational attainment, household size, household income and type of water supply with household gray water recycling practices.

Table 2. Correlation analysis between profile variables and gray water disposal practices

Profile variable	Pearson coefficient, r	P value	Interpretation
Age	.325	.067	not significant
Educational attainment	.119	.191	not significant
Household size	.128	.000	*highly significant*
Household income	.09	.03	*significant*
Type of water supply	.07	.42	not significant

Table 3. Correlation analysis between profile variables and gray water recycling practices

Profile variable	Pearson	P	Interpretation
Age	.32	0.37	not significant
Educational	.12	0.02	Significant
Household size	.22	0.04	*Significant*
Household income	.83	0.03	*Significant*
Type of water	.42	.003	*highly significant*

Significant difference on the gray water disposal practices in the barangays

A highly significant difference was found (p=0.000) on the gray water disposal practices of the respondents. This meant that either the location of the barangays or the cultural practices of the residents in a particular barangay differed from those of the other barangays. This might be attributed to the topography of the place, that is, those living near bodies of water may dump their gray water into the river, sea or lake and the landlocked barangays may have other practices, notably direct disposal to the ground.

Table 4. Analysis of variance on the gray water disposal practices of the barangays

Source of variation	Sum of Squares	Degrees of free-	Mean square	F	*P*
Between barangays	3.786	3	1.262	6.409	0.000*
Within respondents	23.431	116	0.197		
Total	35.941	119			

**highly significant*

Significant difference between the gray water recycling practices in the barangays

A highly significant difference (p=0.00) between the barangays' practices in recycling their domestic gray water was found. This denotes that each barangay have distinctly different way of recycling its gray water which may be influenced by the demographics of its residents. The barangay zoning classification may also influence the recycling practices of its residents.

Table 5. Analysis of variance on the gray water recycling practices of the barangays

Source of variation	Sum of Squares	Degrees of free-	Mean square	F	*P*
Between barangays	10.322	3	3.44	10.127	0.000*
Within respondents	40.429	116	0.340		
Total	50.751	119			

**highly significant*

CONCLUSIONS

1. The heads of the households were middle aged, were literate, having finished secondary school.
2. Households lived just above the poverty level, were medium sized (4-6 members) and had access to potable water through artesian wells and jetmatic pumps.
3. The household gray water disposal practices were: pouring to the drain connected to a septic tank, disposing directly to the ground, disposed by recycling and disposal by throwing to a nearby body of water.
4. The household gray water recycling practices include : used gray water to flush the toilet, in house cleaning, in cleaning pig pens and watering nearby plants.
5. A positive correlation was found between the variables household size and household monthly income with gray water disposal practices;
6. A direct relationship was found between gray water recycling practices and the variables educational attainment, household size household income and type or source of potable water.
7. Highly significant differences were found on the gray water disposal and recycling practices of the barangays.

RECOMMENDATIONS

The following are hereby recommended:

1. A sewerage system must be included in the future development plans in the municipality of San Jose especially in the urban barangays where socialized rate for connection may be considered since poverty may still influence the use of such structures given the inability of many to pay for connections and necessary infrastructure;
2. The Municipal government should endeavor to regulate the unfettered disposal of untreated domestic gray water into bodies of water and to the soil to curb the spread of pathogens that can impact human health and well-being;
3. Further study on the physico-chemical properties of the gray water so that treatments prior to safer disposal may be conducted; and
4. An extension program led by the College of Architecture, Engineering and Technology maybe conducted to educate the people on the

negative impacts of their indiscriminate disposal of their gray water .

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ELDERS' ACCOUNT OF A *WAIG*: A QUALITATIVE STUDY

Wendelyn R. Talbo
Jenny Lou R. Taan
University of Northern Philippines
Tamag, Vigan City

ABSTRACT

This study aimed to assess the elders' account of a *waig* (creek) situated at Borobor, Sto. Domingo, Ilocos Sur. Moreover it attempted to identify the various fauna and flora found in the *waig* alongside with the economic values and social activities related to it. This qualitative research employed informal interviews and observation to gather the data needed. A set of questionnaires was prepared by the researchers as a guide in gathering the data. Results of the study revealed that the *waig* which used to be a habitat for abundant fauna and flora is now eroded and sometimes silted partly because of people's negligence and most probably because of climate change. Furthermore, while the *waig* served as a good site for socialization for women doing some of their chores (like washing and dishwashing) and an ideal place for children's playing and swimming in the past, the *waig* now becomes a prohibited place for the above mentioned activities. Nevertheless, the *waig* is a good source of irrigation though the water coming from it is still not enough to sustain the crops of the community people particularly the farmers. In addition, despite the local government's initiative of restoring the *waig* by instructing the people to maintain it and by distributing fingerlings to them, constant climate change, global warming, and people's lack of concern for the *waig* may endanger the flora and fauna thriving in the said body of water. Based on the results of this study, the researchers forward the following recommendations: (1) to strengthen the local government's campaign on the restoration of the *waig*, a wider scope for information-dissemination for the LGU's projects like posting of slogans or posters around the community and seminar workshops on *waig* restoration may be conducted and (2) to augment the community's main source of income, local officials may coordinate with the LGU's to initiate projects and/or alternative source of living for these people.

Keywords: waig, flora, fauna, socialization, superstition, irrigation, restoration

INTRODUCTION

In 2015, the global development community unveiled its nest agenda, the Sustainable Development Goals (SDGs). Though the SGD has acquired tremendous achievements which took on extreme poverty, hunger disease, and lack of shelter since its birth, many of the world's poor continue to suffer. Anthony Lake of UNICEF put it best: Our national successes are masking moral and practical failures. People are left behind simply because they live in rural communities or urban slums, in conflict zones, as part of indigenous groups, with disabilities or because they are girls. The global development community continues to devise and implement innovative, cost effective ways to deliver social services to those who have no address or live deep in the country side. Reaching the hardest to reach also requires tremendous political will. Moreover, delivering development interventions to the poor is expensive, not because of the price of intervention, but because of what it costs to identify, find and deliver services to the poor and marginalized.

In the Philippines, majority of those living in the rural areas are farmers and fishermen. These farmers and fishermen acquire most of their goods and livestock from their fields and fishponds. Global warming, climate change and other environmental problems, however, threaten their sources of living.

In Ilocos Sur, the farmers and the fishermen are not exempted from this phenomenon. Farmers and fishermen alike are first on the list who are affected by the environmental problems mentioned. Despite the efforts of the government to uplift the social and economic standard of the

people, however, there are still areas which need more attention.

Borobor is one the 36 barangays in the Municipality of Sto. Domingo, Ilocos Sur. It is situated at the eastern part of the said town. It is five kilometers away from the town proper and is surrounded by wide rice fields. Most residents in the barangay are farmers. Therefore, farming is their major source of income. Some of these farmers have their own livestock like carabaos and cows. These livestock are of great help in the various farm works. Other residents have piggeries and poultries as their main sources of income.

Nowadays, however, there are already successful professionals contributing to the fast pace of development in the said barangay.

Borobor is one of the luckiest barangays in the municipality in that it has free and natural irrigation because of the presence of a *waig* (creek). The *waig* in the said barangay extends from the eastern part of Borobor to Lussoc , Sto. Domingo. The *waig* was very essential to every resident because it was not only used as a source of irrigation but also as a washing area, drinking area of livestock and as a swimming area. The *waig* was once clean, pure and free from pollution. It was a good source of nourishments for it yielded different kinds of fish like gourami, paltat (catfish or siluriformes), bontiek (mudfish or neochanna cleaver), among others and shells like duriken, kusikos, and leddeg (black snail or oreochramis niloticus) to name a few. They only used simple fishing materials like the bait, bukatot and palayaw. It is very alarming, however, that these fishes and shells are diminishing because the residents, having caught up with change and development now give little value to the richness of the *waig* that they ignore and are not doing anything to sustain and/or preserve it. Despite this, the *waig* still functions as a source of irrigation for the said barangay though its abundance is no longer enjoyed as it was before. Furthermore, the effect of global warming is also evident.

This observation prompted the researchers to conduct a study that would focus on the assessment of the *waig* in the said barangay based on the accounts of the elders in the community.

OBJECTIVES OF THE STUDY

This study aimed to assess elders' account of the waig situated at barangay Borobor, Sto. Domingo, Ilocos Sur.

Specifically, it sought answers to the following questions:

1. What flora and fauna are found in waig?
2. What are the economic activities of the residents near the waig?
3. What social activities are these residents engaged in?
4. What superstitious beliefs are associated with the waig?
5. What are the different problems encountered by the people living near the waig?

REVIEW OF RELATED LITERATURE

Waig, the vernacular for stream, is a body of flowing water that stays within its banks, or the land on either side. A creek is a stream of small or medium size. Creeks are often shallow and flow into larger bodies of water. While many people would claim that a creek is smaller than a river, not everyone agrees on what makes it a creek. In fact, the definition of a creek may change depending on the part of the world in which it flows.

Often, creeks are appreciated because of the beautiful trees, enjoyable trails, and wildlife surrounding them. This scenery helps residents "forget" for a while their concerns and weariness. Living near the creek, thus, makes life more comfortable and bearable. At present times, however, the comfort that the creek offers seems to have been replaced with distaste and discomfort because of human abuse and negligence. Looking closely at the creeks now, one can find a variety of trashes, dog's, horse's, and other animal wastes and even worse, sewer systems are evidently running through them.

Maintaining creeks and other waterways is a challenge that must be considered by the residents near them because of the many benefits that may be acquired from these creeks. Clean and healthy waterways provide a variety of less-tangible benefits. They boost jobs, property values, and tourism, which is even more critical during tough economic times. These observations are consistent with the reports given by the Delaware Riverkeeper, American Rivers, and the EPA. Functional waterways also help filter storm flows and those occasional sewer mishaps that flow in the creeks. The slow flooding (which we do on occasion - reference January 2010) provide enough high quality habitat for birds.

The study of Regua (2015) assessed the rehabilitation of the Vigan City Mestizo River in

terms of the socio- demographic profile of the respondents , physical-chemical characteristics of the river before and after the rehabilitation program, level of awareness of the respondents in the rehabilitation of the Mestizo River , and the level of implementation of the Rehabilitation Program of the Vigan City Mestizo River. Results of the study show that the water quality of the Mestizo River has improved through its rehabilitation. Likewise, its physical features in terms of width and depth has also increased.

In a related study, Kidmai (2005) assessed the Bang Pakong River Basin Communal Irrigation System in Chachoengsao Thailand as implemented by the Royal Irrigation Department for the period of 1997-2002. Based on the results of the interview with the Royal Irrigation Department (RID) community, majority of the respondents' children were in the elementary level, majority of them did not get sick, they did not worry about money for daily needs, and they were respected by their neighbors, and had greater self-respect since they could provide for their daily needs. Farmers claimed they had more time to socialize and had sense fulfillment because they could provide for their daily needs.

In another study, Burami (2010) assessed the management of the environment of the Bangpakong River under the Local Government Units in Chachoensao Province, Thailand and looked into the influence of the administrative capability of Local Government Units and the participation of non-governmental organizations ((NGO), volunteers and educational Institutions in the program implementation.

Another study was conducted by Gorme, Maniquiz, Song, & Kim (2010) which focused on identifying the current status, management, and future recovery of the water quality of the Pasig river in the City of Manial, Philippines. The researchers found out that despite the efforts of the government to control the water quality of the said river, its condition continues to worsen. The data obtained from it indicate that the target water quality for Class C waters have not been achieved since 2003 and the identified factors causing this were insufficient government funding and the lack of support from the residents of Metro Manila to cooperate with plans and mandates. Aside from these factors, natural disasters as floods and droughts have constantly plagued the water. Government interventions have now been initiated which the researchers believe will be able to bring back the once pristine waters of Pasig river and many other water bodies.

Relatedly, the Asian Development Bank (2018) reported on young volunteers' attempt of reviving a dying creek in Taytay, Rizal and inspired entire communities to follow suit. The group gained partners from member countries of the Association of South East Asian Nations (ASEAN) who committed to help them rehabilitate creeks.

There are many studies aimed at rehabilitating creeks and it is to these that this study was anchored.

METHODOLOGY

This study attempted to assess the waig situated at Borobor, Sto. Domingo, Ilocos Sur based on the account of the elders in the said community. Moreover it attempted to identify the various fauna and flora found in the waig alongside with the economic values and social activities related to it and problems encountered by the community people if any.

The researchers employed the qualitatitve-descriptive research design to obtain data from the participants who were residents of Borobor and Paras, Sto. Domingo, Ilocos Sur. These participants were witnesses of the once pristine waters of the creek and its gradual changes. Moreover, the researchers used, as a guide for their interviews, a set of questionnaires they prepared. Part I identifies the various fauna and flora found in the waig before and at present, Part II gives the benefits of these fauna and flora found in it, Part III reveals the economic activities and social activities of the residents near the waig, and superstitious beliefs associated with the waig, and Part IV deals with the problems encountered by the community as accounted for by the elders in the same community.

RESULTS AND DISCUSSIONS

1. Fauna and Flora Found in the Waig Before and at Present

According to the eldest respondent interviewed, the waig was once blessed with abundant fauna like: bontiek/dalag (mudfish) , paltat(catfish), igat(catfish) whose width was the same that of the leg of a nine –year old child, tilapia (nile tilapia), whose size of a plastic plate, gurgurami (gourami) , kappi (crab) , bonug (gobi fish), udang (shrimp) , kuros (small shrimphs) , suso, bisukol (snail) , leddeg (black snail), gurong,

dakumo, and birabid . The residents found their life simple, yet they were contented because of these blessings from the waig. The respondent recalled how the waig provided them with food not usually found in the market during those days. Moreover, these bountiful food were fresh and nutritious apart since the community never resorted to using insecticides and pesticides in fishing. In other words the river was free from any kind of pollution.

In addition to these fauna, the river was also abundant with flora such as aba, swamp cabbage, and ballayba. These flora also served as their food. Sometimes they brought them to the market to augment their income. During those days, lack of produce was never a problem because there was more than enough fauna or flora to supply their daily needs. Apart from that, the farmers saw to it that what they would harvest would also be replaced so these products of the river would not totally diminish.

Nowadays, the farmers of the community have observed that fauna such as mudfish and catfish are visible only a few months after the rainy season. Likewise, goby fish, gourami, among others are now rarely found in the river. Nile tilapia, one of their favorites, is also scare since fishponds where this fish usually come from have now dried up unlike in the past when these fishponds were always flooded making way for a good habitat for this fish. Consequently, fishpond owners, having no profit from dead fingerlings due to the bad weather and temperature, have now neglected their fishponds. The quality of fish being harvested has also diminished. For instance, the eel which used to be of bigger size is merely two inches in width now. Worse, fauna like leddeg, bisukol, dakumo, and birabid are now extinct because of community people's unhealthy practices like washing of clothes and of sprayers after use and throwing of household garbage into the river.

Flora like aba, ballayba, and swamp cabbage also have become extinct since the waig is now silted and totally dry during summer months and that consumers never dare to leave nor replace something that would propagate in it.

1.If the residents of the community do not make ways to nurture the waig and continue instead their poor and unhealthy practices of dumping their trashes into it or washing toxic materials, equipment or anything harmful to the fauna and flora in it, it is not impossible that these fauna and flora will all become endangered or worse, extinct in the years to come. This is added to the fact that the environment, in general has been damaged by global warming.

2. Economic Activities of the Residents in the Waig

a. Economic value

One of the farmers interviewed was on his late 50's and has witnessed or even experienced the kind of life and living that the people had during those days when fauna and flora were still abound in the waig. Accordingly, life then was simple and people have simple lifestyles. Their abundant catch from the waig enabled them to get by and provide well for their families. At full moon, it was observed (believed) that crabs abound and at rainy season, their bukatot (fishing net) could catch as much as they desired – crabs, gourami, shrimps, blue land crab, gobi fish, among others. Their bountiful catch also left them still plenty to bring and sell in the market so that the family didn't have only fish for their viands but also other kinds of food bought in the market. Kangkong , ballayba and aba were also harvested in the waig and were sold in the market (sometimes in Vigan public market for higher price). What profit they could get from selling would be used in buying their needs in Vigan for a cheaper price. Such simple life made them content and grateful for the blessings they received from the waig.

At present, however, these activities are no more enjoyed by the community people in as much as most, if not all of those fauna and flora in the waig have become extinct. People have nothing more to sell to the neighboring barangays or in the market. Moreover, whatever fauna or flora left in the waig are no longer safe or advised for consumption since the water, in a way, has already been polluted. The old vendors can only look back to those days and reminisce what are worth sharing to the present generation. Negligence, pollution, and poor practices of the people in the community resulted to this extinct of fauna and flora.

1.One good thing, however, is that the waig is not totally laid waste. It now serves as a source of irrigation of farmers' main crop and second crop. The irrigation benefits the farmers of Borobor, Lussoc, some parts of Napo, and Paras, Sto. Domingo, Ilocos Sur.

2.b. Economic activities

3.The farmers/residents of Borobor. Sto. Domingo used fishing materials that were ecofriendly like bukatot, banniit (bait), and palayaw. Small fauna were released from the different fish-

ing materials and let them grow until they were ready to be harvested. Still, the residents were able to catch plenty – crab, mudfish, dalag, shrimp, eel and catfish which are either served for family consumption or were sold in the neighborhood or in the market.

4.Nowadays, residents of the same barangay are prohibited from using bukatot perhaps to limit the catch or to leave some for those who do not own one (bukatot). Because of this prohibition, the residents resort to illegal ways of fishing like the use of koryente and tuba (poisonous chemicals), ironically, however, catching even the smallest fish.

5.Relatedly, the Local Government Unit of Sto. Domingo initiates programs and projects that would help restore the waig, thereby helping the people in the community get by as well. For instance, fingerlings are distributed for the residents to raise while the water level is still enough and the water quality is ideal for nile tilapia raising.

6.Moreover, the office of the Department of Social Welfare and Development extends its hand in elevating the economic status of the 4 Ps members by providing catfish fingerlings for the recipients to raise. However, the present condiquality of the waig affect the growth of the catfish.

3. Social Activities of the People in Waig

One of the elders interviewed recalled that the waig used to be filled with children and adults who enjoyed its cool, clear, and clean water as they played, chatted, or swam/bathed especially in the mornings and in weekends. Further, it was during these occasions that they socialized and caught up with one another's lives.

On some occasions, however, especially when the waig was flooded, residues from the flood and pointed materials caused children to slip and even get wounded. Sometimes, they got sick or acquired fever probably from being drenched too long or from being exposed under the sun – an occurrence which made people believed had been caused by unseen elements and/or forces. Consequently, they would offer (atang) something in the waig to appease these unseen elements/forces.

The clean and clear water of the waig also encouraged mothers to wash their clothes into it to save time from pumping or fetching water from their wells. In addition, to washing their clothes, mothers also wash their dishes and other kitchen utensils in the waig. Moreover, some farmers wash their palay seedlings (bonobon) in the waig before they would be transplanted.

Likewise, most of the many residents perform the final burial rite of their relatives in the waig. This is what they call gulgol, a symbolic act of washing their face with water from the waig signifying their release or their acceptance of the death of their relatives who have just been buried.

As time passed, however, these social activities have little by little diminished if not been totally abandoned because the water condition of the waig is no longer ideal for the said activities. Furthermore, the belief system of the people in terms of hygiene and sanitation, farming, among others have already changed as a result of the innovations in science and technology.

4. Superstitious Beliefs Associated with the "Waig"

Many of the residents believed that the waig was inhabited by some unseen and magical elements/forces. For instance, the death of anyone near or in the waig may be caused by these unseen and/or magical elements/forces. In one of the interviews conducted, for example, the interviewee shared an incident many years ago which up to these days, the people still believe in. Accordingly, a baby mermaid (allitaw) was responsible in the death of her baby sister who was just a year and two month-old when she disappeared in the waig. At that time, the interviewee (the baby's sibling) was babysitting the victim while she was cooking since her parents were busy in the field. The baby might have slipped into the waig but the residents accorded the accident to the baby mermaid. Since that day onwards, the residents have become more careful but weary of bringing their children into the waig. They believed, this baby mermaid lived in the deep holes (rukab) on the sides of the waig. Nowadays, the residents are still wary of allowing their children into the waig not because of this superstition but because the water has already been contaminated by refuse and other rubbish materials thrown into it. Furthermore, barangay officials are constructing walls or barriers to prevent children from going into it.

5. Problems Associated with the Waig

Apart from incidents associated with the superstitious beliefs of the people, there were no problems encountered by the community during those days. If there were any, they were only minor ones like clothes being carried by running water, or slippers lost by children playing or swimming in the waig.

In the past years, however, the residents experienced disasters that were partly caused by the waig but more so by the very strong typhoon On-

doy. The community was flooded with mud, bamboo branches, and refuse. The flood also destroyed about 80% of the community's farm crops crippling the people's main source of income.

The months of November until February are considered lean months since it is during these months that the waig is at its lowest level. Though it is irrigated, it is still not enough to sustain the crops of the entire community. Consequently, there are areas of the rice fields which are not planted because of the lack of irrigation. Moreover, some parts of the waig have already eroded affecting some properties of the community people.

These posts threats to the people whose main source of income is either farming or fishing. On the social aspect, they may also cause misunderstandings between and among these framers who are all depending either on the waig, the rice fields, or both.

CONCLUSIONS

The waig which used to be a habitat for abundant fauna and flora is now eroded and sometimes silted partly because of people's negligence and most probably because of climate change.

The waig is a good source of irrigation but the water coming from it is still not enough to sustain the crops of the community people particularly the farmers.

Further, the waig which was once a good site for socialization for women doing some of their chores (like washing and dishwashing) and an ideal place for children's playing and swimming, now becomes a prohibited place for the above mentioned activities.

The death of anyone near the waig may be caused by unseen and / or magical elements in it, like a baby mermaid (allitaw) who lived in the deep holes (rukab) on the sides of the waig.

Minor problems occur to residents near the waig, like clothes being carried by running water, or slippers lost by children playing or swimming in the waig.

The local government initiated activities geared to the restoration of the waig by instructing the people to maintain it and by distributing fingerlings to them but constant climate change, global warming, and people's lack of concern for the waig, the threat of total extinct of the flora and fauna in the said body of water continue to challenge both the people and the local government officials.

RECOMMENDATIONS

Based on the findings and the conclusions drawn from this study, the researchers forward the following recommendations: (1)To strengthen the local government's campaign on the restoration of the waig, a wider scope for information-dissemination for the LGU's projects like posting of slogans or posters around the community and seminar workshops on waig restoration may be conducted and (2) to augment the community's main source of income, local officials may coordinate with the LGU's to initiate projects and/or alternative source of living for these people.

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