Republic of the Philippines
EULOGIO "AMANG" RODRIGUEZ
INSTITUTE OF SCIENCE AND TECHNOLOGY
Nagtahan, Sampaloc Manila

VOLUME XVIII, No. 23 ISSN 0119-0212 JANUARY-JUNE 2019

EARIST RESEARCH JOURNAL

"Knowledge and Technology Transfer: Barometer of Excellence in Research Innovation"

The EARIST Research Journal seeks to further the discussion, advancement, and dissemination of research, planning, development and production concerns and knowledge along professional, scientific, technological, technical and vocational instruction and training in trades, business, arts, sciences and technology.

The opinions expressed in the articles are those of the author or authors; they are not necessarily the views of Eulogio “Amang” Rodriguez Institute of Science and Technology, and the Office of the EARIST Research Services.

Correspondence concerning contributions, subscriptions, advertising, permission to reprint the articles, and other business matters should be addressed to EARIST Research Services.

FOREWORD

The Eulogio "Amang" Rodriguez Institute of Science and Technology takes pride in publishing Volume XVIII, No. 23, January - June 2018 of the EARIST Research Journal as it contributes to the attainment of EARIST's Mission, Vision, Goals, and Objectives through scholarly publications.

This volume is the output of researches conducted by EARIST faculty during the School Year 2017-2018. This volume highlighted twenty nine (29) distinct researches in different fields, but most noteworthy, each individual research achievement.

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

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

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

Engr. Rogelio T. Mamaradlo
Director, Research Services

TABLE OF CONTENTS


analysis
qualitative
Technical
Research

DESIGN AND DEVELOPMENT OF PORTABLE AND FOLDABLE DRAFTING TABLE

Esmeralda W. Ayag

INTRODUCTION

This 21st century era, everything is getting smaller, portable, and foldable especially the gadgets and equipment that we are using in our everyday living but not only that a housing units now a days are smaller. In the city, the kind of housing that we have are condominiums; therefore, we only have limited space. With this limited space, we cannot afford to have bigger furniture just like a standard drafting table which is the subject of the study. Portability is the trend most especially among millennial because people now a day move from one place to another so everything should be hand carried. Foldable furniture is also salable in this era because it fits the kind of housing units and the living condition that we have.

Drafting table is the basic tool of drafting students and professionals. According to Noton (2011), drafting table is a specialized table with a hinged top that can be raised from flat to upright and at any angle in between. It has a lip along the stationery edge to hold pencils, pens, and other drafting instruments. The use of drafting tables started before the industrial revolutions which were part of a gentleman's study. It is used for drawing, painting and for reading large volumes and newspapers. Drafting tables before were very heavy which were made from oak. It has a raising and lowering apparatus to keep the table top at the desired angle and height. During the industrial revolution the drafting table became an office or shop fixture. It became light and made of less costly materials. During this period it became popular. They were found in the courthouses, country clerk offices, and libraries. The modern drafting table is patronized by artists, designers, architects and some engineers with a wide range of styles and types available. In the market there are available drafting tables intended for professionals and students with drafting courses. They vary in size and weight but mostly expensive for a student who belongs to lower bracket of society. "Modern drafting tables are sleek steel framed tables with cleanable vinyl cover." The latest among the portable drawing table is the small folding drafting table with the size of "12 x 24" (Alibaba.com,2018).

Interior design program has a high demand in manual drafting works both in school and at home. Skills development is one of the areas that students need to enhance to become a good designer and it is also a requirement in passing the board exam. EARIST, as a state college, is a school for students who belong from the mid to lower bracket of the society whose homes have limited space. It cannot accommodate a fixed drafting table that is why a portable and easily tucked away drafting table is a good idea. Often times, they use their dining table in doing drafting works and they still need to wait for everybody to finish eating dinner before they can use the table. One of the reasons why students do not produce quality take home plates is the absence or lack of a quality drafting table at home.

During the taking of board exams examinees are required to bring their own drafting board or tables if they can. Since the board exam has time limit to show their skills in drafting having an uncomfortable working condition in using a board on their lap will give them a hard time producing good drawings. That is why they are encouraged to bring a drafting table. It is also hassle to bring a fixed drafting table because of its weight and bulkiness. Another problem is the transportation of the drafting table to the school where they will take the board examination. It is in this thought that a portable light weight drafting table is needed.

The objective of the study is to develop a lightweight portable drafting table for students taking up drafting courses so that they can bring it anywhere where it is needed. The researcher who is a professor of Interior Design and Ms. Jinky Dayag an Interior Design 3rd year student would like to help the Interior Design students of EARIST produce quality plates that is why the researcher decided to pursue the study on the design and development of a portable and foldable drafting table which is flexible and space saving .

STATEMENT OF THE PROBLEM

Generally, the study aimed to develop a lightweight portable and foldable drafting table.

Specifically, the study aimed to answer the following questions:

1. What is the design of the portable drafting table?

2. How may the portable and foldable drafting table be developed?

MATERIALS AND METHODS

Research Design

The study employed the developmental research design. Developmental Research pertains to instructional development. It is the systematic study of designing, developing, and evaluating instructional programs, processes and products that must meet the criteria of internal consistency and effectiveness. Developmental Research has two types. Type 1 studies and addresses product design, development and evaluation. Type 2 studies focus upon a given design, development, or evaluation model or process (Richey & Klein, 2005).The Type 1 developmental research design was used in this study to develop a portable drafting table which will help solve the problem of the interior design students of Eulogio “Amang” Rodriguez Institute of Science and Technology College of Architecture of Fine Arts Interior Design Department (EARIST).

Procedure

Design and Manufacturing Process

Design and construction of the stands

The legs are made up of hardwood.

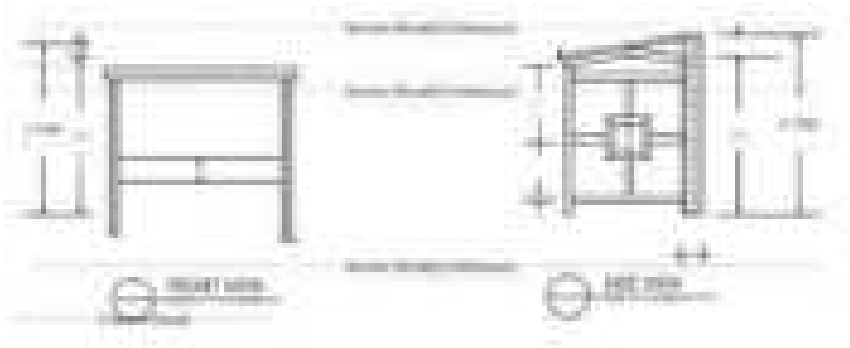


Figure 1: Design and Construction of the Stands

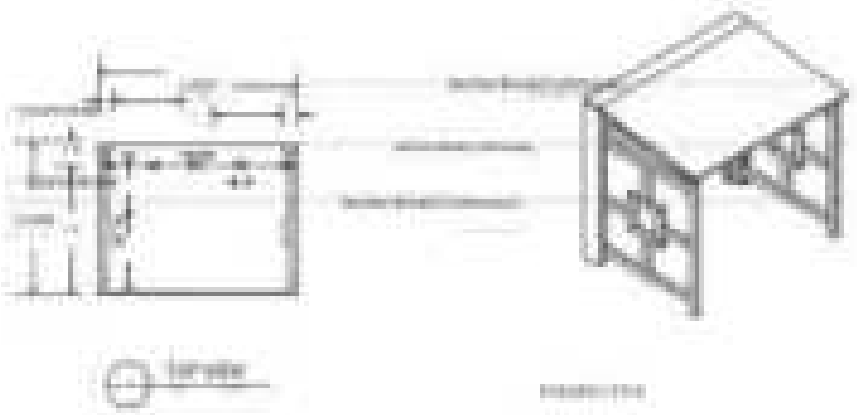


Figure 2: Foldable Drafting Table Construction Detail

CUTTING LIST

IN METERS (M)	L	W	T
1. Table Top (1)	.80	.60	0.02
2. Hinges (11)	.04	.03	.001
3. Back Panel (1)	.68	.02	.02
4. Leg Frame Short (2)	.73	.02	.02
5. Back Support (1)	.68	.10	.02
6. Back Leg Support (2)	.73	.08	.02
7. Leg Frame Wide (2)	.73	.08	.02
8. Back Leg (2)	.47	.03	.02
9. Top Frame (2)	.53	.03	.02
10. Top Stretcher (2)	.47	.03	.02
11. Post (8)	.15	.03	.02
12. Rail (8)	.18	.03	.02
13. Front Leg (2)	.47	.03	.02
14. Bottom Stretcher (2)	.47	.03	.02

Table 1

Bill of Materials for Portable Drawing Table

Serial No.	Part Description	Material	Quantity	Cost Per Part	Total Cost
1	Table Top	1”x24”x30” plyboard	(1)	Php 250.00	Php 250.00
2	2 ½ Hinges	Metal	(11)	20.00	220.00
3	Back Panel	2”x2”x28”x48” solid wood KD	(1)	70.00	70.00
4	Leg Frame Short	2”x2“x51”solid wood KD	(2)	70.00	140.00
5	Back Support	2”x4” x28” solid wood KD	(1)	120.00	120.00
6	Back Leg Support	2”x2½”x19” solid wood KD	(2)	35.00	70.00
7	Leg Frame Wide	2”x2½” x51” solid wood KD	(2)	90.00	180.00
8	Back Leg	2”x2½”48” solid wood KD	(2)	90.00	180.00
9	Top Frame	2”x2½”x6” solid wood KD	(2)	15.00	30.00
10	Top Stretcher	2”x2½”x47” solid wood KD	(2)	90.00	180.00
11	Post	2”x2½”x6” solid wood KD	(8)	20.00	160.00
12	Rail	2”x2½”x8” solid wood KD	(8)	25.00	200.00
13	Front Leg	2”x2½”x19”solid wood KD	(2)	35.00	70.00
14	Bottom Stretcher	2”x2½”x19” solid wood KD	(2)	35.00	70.00
				miscellaneous	**150.00**
				TOTAL	**2,120.00**

RESULTS AND DISCUSSIONS

The portable and foldable drafting table is designed to help the students taking up drafting and design courses to produce quality outputs. It is designed Minimalist oriental. It is developed using the following materials: hard wood, ply board, glue, nails, and butterfly hinged. It’s a one piece foldable drafting table oriental inspired legs in 2” x 2½” KD. Hardwood, 1” plywood with 1” x 1” edging and pencil stopper. All parts are glued and nailed for with 1 and 1/2 finishing nails. Moving parts are attached with 2½” x3 butterfly hinged. It is finished with stained varnished.

CONCLUSIONS

Portability is the main objective of the drafting table. It is seen from the figures that the portable drafting table is designed to cater the needs of the students taking up interior design. It is portable, foldable and one piece for easy transport. It is developed using locally accessible resources. It is easily assembled using butterfly hinged. Compared to other drafting table in the market the developed portable and foldable drafting table is cheaper. It only cost Php. 2,120.00. This developed drafting table will help the students in their drafting courses.

REFERENCES

Noton, Adrain (2011) A Brief History of Drafting Tables Retrieved on May 7, 2018 from http:// Ezine Articles. com/expert/Adriana_Noton/446836.

Portable Drating Table. https://www.amazon.com/Art-Supply-Artist-Adjustable Drawing/ dp/B01MSDP7Z2/ref=sr_1_16?ie=UTF8&qid=1428873839&sr=8-16&keywords= portable+drafting+table Retrieved on June 13,2018.

Richey, Rita .C. & Klein,James D. (2005). Developmental Research Methods: Creating Knowledge from Instructional Design and Developmental Practice. Journal of Computing in Higher Education. Vol.16 (2), 23-38.

BASIC MATHEMATICS AND PHYSICS SKILLS OF SELECTED BSAP STUDENTS SY 2017-2018

Daisy M. Bongtiwon

INTRODUCTION

Mathematics is a subject with many fields, and the character of the various fields is in some instances very different. Although not all of mathematics relates to science, mathematics is an integral part of most sciences. As mentioned above, mathematical concepts can turn out to have applicability far beyond the context they were originally developed in. Seeing mathematics in context could thus be regarded as helpful when concept images are formed. In school, students have to consider this duality of mathematics when learning both mathematics and science. Sometimes it is necessary to see situations in which mathematics is applied in order to understand the concepts. Other times it is necessary to weed out some parts of the context presented in a task and reduce the task to pure mathematic in order to solve it.

Physics is one of the science subjects in school in which mathematics is a natural part. The relation between the school subjects mathematics and physics are reflected both in mathematics education research and in physics education research. Some of the discussions focus on how physics can influence the learning of mathematics, referred to below as physics in mathematics. Other discussions focus on the learning of physics and are concerned with various aspects of its relation to mathematics, and this is referred to as mathematics in physics. Since physics describe and formalise real-life phenomena, physics tasks that have to be solved by using some kind of mathematics, can be viewed as special cases of mathematics tasks with real life context.

Blum and Niss (1991) noticed already in the 80's that the relation between the two subjects mathematics and physics had become weakened in the mathematics education. The main reason for this diminished relation depends, according to Blum and Niss, on that new areas have developed, in which mathematics is important, and that these areas can provide examples suitable for mathematical instructions instead of examples from physics. They agree on the necessity of the opening of mathematics instruction to other applicational areas, but at the same time they stress that it is of great value to keep a close contact between mathematics and physics in school. Examples from physics provide good representative cases for validating mathematical models. They discuss how a separation between the two subjects can lead to unnatural distances between the mathematical models and the real situation intended to model.

The weakened relation between the school subjects mathematics and physics is also observed by Michelsen (1998), who described how the separation of the two subjects has evolved in the Danish school. In a paper by Doorman and Gravemeijer (2009), the authors discussed the advantage of learning mathematical concepts through mathematical model building and how examples from physics allow for a better understanding of the concepts. Hanna (2000), and Hanna and Jahnke (2002) proposed that it is advantageous to use arguments from physics in mathematical proofs to make them more explanatory.

Polya (1954) and Winter (1978) continued discussing the benefits of integrating physics in mathematics education while learning and dealing with mathematical proofs. The importance of using physics to facilitate students' learning of various mathematical concepts is also discussed by Marongelle (2004), who concluded that using events from physics can help students to understand different mathematical representations.

Tasar (2010) discussed how a closer relation between the school subjects, mathematics and physics, can contribute to the understanding of physics concepts and can help ensure that students already understand the mathematical concepts needed in physics. Similar suggestion are made by Planinic, Milin-Sipus, Katic, Susac and Ivanjek (2012), who in their study of high school students' success on parallel tasks in mathematics and in physics concluded that students' knowledge is very compartmentalised and that stronger links between the mathematics and physics education should be established.

According to Basson (2002), a closer relation might also decrease the amount of time physics teachers spend on redoing the mathematics students need in physics. The redo is likely a consequence of that "physics teachers claim that their students do not have the pre-requisite calculus knowledge to help them master physics" (Cui, 2006). Michelsen (2005) discussed how interdisciplinary modelling activities can help students to understand how to use mathematics in physics and to see the links between the two subjects.

Redish and Gupta (2009) emphasised the need to understand how mathematics is used in physics and to understand the cognitive components of expertise in order to teach mathematics for physics more effectively to students. Basson (2002) mentioned how difficulties in learning physics not only stem from the complexity of the subject but also from insufficient mathematical knowledge. Bing (2008) discussed the importance of learning the language of mathematics when studying physics. Nguyen and Meltzer (2003) analysed students' knowledge of vectors and conclude that there is a gap between students' intuitive knowledge and how to apply their knowledge in a formal way, which can be an obstacle when learning physics.

Doorman and Gravemeijer (2009) noticed (with reference to Clement 1985 and Dall'Alba et al. 1993) that most of the attention in both physics and mathematics is on the manipulations of formulas instead of focusing on the conceptual understanding of the formulas.

Physics is a science developed to describe and model our real world and mathematics is essential in order to formulate the models. If students focus on imitative reasoning when solving physics tasks, one can assume from the previous discussion that they will be given less opportunities to understand the underlying mathematical concepts that occurs in the models. This possible lack of understanding of the mathematics presumably affects the understanding of the physics and then also students' learning of physics. It seems that the mathematical reasoning that is required by students when they are solving physics tasks is not as well studied as the reasoning students use in physics classes.

It is common in the physics classes that students solve routine tasks and focus on manipulations on formulas instead of focusing on the conceptual understanding of the underlying principles. A reasonable assumption is that if there is more focus on physics procedures than on the understanding of physics concepts, there is also little focus on creative mathematical reasoning.

In order to give all students the same possibilities to learn mathematics, it should be desirable to use relevant contexts from students' everyday life when mathematical concepts are introduced. Academic program should be implemented so that the mathematical skills of students will be enhanced along with their physics skills and knowledge.

Checking students' knowledge on basic algebra and physics will help students to succeed and finish the course of BS Applied Physics. After the assessment, an academic program will be implemented to fully accomplish this research.

STATEMENT OF THE PROBLEM

This study aimed to determine students' knowledge on basic algebra and basic physics as bases for the upcoming academic program for BSAP students.

Specifically, it sought to answer the following questions:

1. What is the level of students' knowledge in basic Physics and basic Algebra?

2. Is there a significant correlation between the scores of students in basic physics with their math skills?

    a. Addition of Polynomials

    b. Subtraction of Polynomials

    c. Multiplication of Polynomials

    d. Division of Polynomials

    e. Solving Equation in one variable

3. What academic program can be proposed in order to improve the achievement of students in both Mathematics and Physics?

METHODOLOGY

The study used both qualitative and quantitative approaches. Qualitative approach for the assessment of basic algebra and quantitative approach for basic physics.

For the assessment of basic algebra, students were given 10 questions about the four operations of algebraic expressions (addition, subtraction, multiplication and division) and equation in one variable. Each student will answer these questions for 30 minutes only. While the physics test are given on the same day with Mathematics. The physics test consisted of 60 questions in Physics 1. It includes concepts and problem solving skills.

To determine the correlation between physics achievement and basic math skills, point-Biserial coefficient was used since the result of the physics test is continuous and the result of math test is dichotomous (yes or no). Yes if the skill is present, and no if not present.

RESULTS & DISCUSSION

After undergoing series of procedures, the researcher was able to come up with the concept that Mathematics skills are still relevant and required for students taking BS Applied Physics. Furthermore, problem solving physics requires mathematical analysis that needs basic calculations.

A. Level of Students' Knowledge in Basic Physics

As shown in Table 1, 77% of the total respondents are beginner, 2% are developing, 11% are good and only 2% have very satisfactory level. In general, only few students are good in this course. Therefore, an academic program is a good avenue for the students to develop their skills and succeed in Physics.

Table 1. Percentage & Frequency Distribution According to Level of Physics Knowledge

Level	No. Students	Percentage
Beginner	44	77%
Developing	2	4%
Good	6	11%
Satisfactory	4	7%
Very Satisfactory	1	2%

As shown in Table 2, 44% of the total respondents are beginner, 28% are developing, 12% are good, 7% are satisfactory and only 9% have very satisfactory level. In general, only few students are good in this Mathematics. Therefore, an academic program is a good avenue for the students to develop their Mathematical skills and succeed in Physics.

Table 2. Percentage & Frequency Distribution According to Level of Basic Math Skills

Level	No. Students	Percentage
Beginner	25	44%
Developing	16	28%
Good	7	12%
Satisfactory	4	7%
Very Satisfactory	5	9%

B. Correlation between the scores of students in basic physics with their math skills; addition, subtraction, multiplication, division and solving equations

Table 3. Correlation between Physics knowledge and math skills

Skill	Frequency of Students	Point-Biserial Coefficient	Interpretation
Addition of Polynomials	42	0.13	Slight correlation
Subtraction of Polynomials	15	0.12	Slight correlation
Multiplication of Polynomials	38	0.016	No correlation
Division of Polynomials	9	0.2259	Slight correlation
Solving Equation in one variable	39	0.0087	No correlation

Using Point-Biserial coefficient, the correlation between physics knowledge and math skills was determined.

Out of 57 students, 42 of them got correct answers in addition of polynomials, 15 got correct answers in subtraction of polynomials, 38 got correct answers in multiplication, 9 got

correct answers in division of polynomials and 39 of them are good in solving equation in one variable.

As shown in Table 3, there is a slight correlation between physics knowledge and the skills of addition, subtraction and division of polynomials. While there is no correlation between physics knowledge and skills of multiplication and solving equations.

C. Academic program can be proposed in order to improve the achievement of students in both Mathematics and Physics?

In order to address the problems of students in Physics and mathematics, an academic program for BSAP students will be implemented. Since most students are having problems in the procedural knowledge in Mathematics, there will be sessions to practice mathematics in school campus.

To address the struggle on developing problem solving skills, a specific time for physics problem solving will be given to students during their vacant periods.

ACADEMIC PROGRAM FOR BSAP STUDENTS

Name of Student: _____ Basic Math Skills Level 1

	Schedule	Rating
Integers		
Addition of Polynomials		
Subtraction of Polynomials		
Multiplication of Polynomials		
Division of Polynomials		
Equation in One Variable		
Equation in Two Variables		

Results and Advice:

_____
_____
_____
_____
_____

CONCLUSION

In the light of the results and discussion, mathematical skills are really needed to succeed in Physics. The mathematical analysis is much needed in problem solving and in analyzing situations related to physical laws of nature. The present physics knowledge of students are very low and also their mathematical skills. Most of the students belong to the beginner level only.

Since there is a slight correlation between math skills and physics knowledge, this result shows that these two subjects always go together and affect each other.

Academic Program is a good benchmark to help students succeed in physics and at the same time in Mathematics.

RECOMMENDATION

In the light of the conclusion, it is recommended that an academic program for each BSAP student must be discussed and started in the early years of students until she reaches her fourth year level in order to make sure to succeed in Physics.

REFERENCES

Ball, D. & Bass, H. (2003). Making mathematics reasonable in school. In J. Kilpatrick, G. Martin & D. Schifter (Eds.), A Research Companion to Principles and Standards for School Mathematics, (pp. 27-44). Reston VA: National Council of Teachers of Mathematics.

Baroody, A. J., Feil, Y., Johnson, A. R. (2007). An Alternative Reconceptualization of Procedural and Conceptual Knowledge. Journal for Research in Mathematics Education, 38(2), 115-131. Stable URL: http://www.jstor.org/stable/30034952.

Bassok, M. &Holyoak, K. (1989). Interdomain Transfer Between Isomorphic Topics in Algebra and Physics. Journal of Experimental Psychology: Learning, Memory, and Cognition, 15(1), 153-166. doi:10.1037/02787393.15.1.153.

Basson, I. (2002). Physics and mathematics as interrelated fields of thought development using acceleration as an example. International Journal of Mathematical Education in Science and Technology, 33(5), 679–690. doi:10.1080/00207390210146023 Bell, A. (1993). Some experiments in diagnostic teaching. Educational Studies in Mathematics 24(1), 115-137. doi: 10.1007/BF01273297.

CAMPUS STREET LIGHT POWERED BY RENEWABLE POWER SOURCE: SOLAR PANEL

Rolf Irwin C. Dangla Cruz

INTRODUCTION

With the Intensification of energy crisis all over the world, a project called, "Campus Street Light Powered by Renewable Power Source: Solar Panel" was developed.

All the countries are looking for the ways to solve this serious problem. One way is to search the new energy and to take advantage of the renewable source and another way is to exploit the new energy-saving technologies to reduce energy consumption, and to improve utilization efficiency of energy.

Solar energy is the most common, direct and clean energy on the planet we have already found until now. The solar resources can be seemed inexhaustible. LED is a solid state semiconductor device which can convert electrical energy into visible light. It is characterized with small size, low power consumption, long service life and environmental-friendly. The spectrum of the LED is a most concentrate in the visible light spectrum, so it has a high luminous efficiency which can be describes as the great reform in the solid light source. This essay briefly describes the solar led street lighting system. It uses the solar radiation energy to charge the battery with the solar panel during day time, and offer energy to the LED light equipment at night. This system has a double advantage in both utilization of new energy and energy-saving.

One of the most used in the world is power source. Solar panel has become an important alternative energy source in every part of the world because it helps the people use electricity by the use of sunlight that absorbs by the panel and make it an alternative power source to apply in the household, schools/universities and other industrial building. In the business industries and government facilities like schools/universities, they want to minimize the expenses in the electricity bill as much as possible. With the use of solar panel, they will be able to conserve energy and reduce their electrical bill which will help them to minimize their expenses.

BACKGROUND OF THE STUDY

People now a day think of ways to find alternative power source that would help them to make life easier. The introduction of solar energy to our new technology has given an alternative for people who don't have access electricity provided by private companies. Solar energy can produce electricity for households, school communities and supple power for equipment such as telecommunication, machines and most especially for our lights.

The researcher try to innovate the common power source using Photovoltaic device which will help conserve consumption in power source, save fund in electric bills, and then make the sunlight as an alternative source of energy to generate electricity.

This is an actual practice in putting theory into application through the production of a dynamic innovation of a product that may help people conserve energy.

According to Becker 15.9 Giga watts of solar photovoltaic system installations were completed with solar photovoltaic pricing survey and Market Research Company's photovoltaic insights reporting growth of 117.8 % In solar photovoltaic installation in a year basis. Based on our study that photovoltaic / solar panel is a term which covers the conversion of light into electricity using semiconducting materials that exhibit the photovoltaic effect, a phenomenon studied in physics.

After hydro and wind power, photovoltaic is the third renewable energy source in terms of global capacity in 2014 worldwide installed photovoltaic capacity increased to 177 Giga watts which is two percent of global electricity demand. China followed by Japan and the United States, is the growing market while Germany remains the world largest producer, with solar Photovoltaic providing 7% of annual domestic electricity consumption.

Based on this study the photovoltaic is very useful. Many of the researchers typically observed solar panel during every day activities.

One example is a calculator that may seem to work for a long time even though they did not put any batteries in it. In additional, a large number of solar panel was spotted outside of the city. Solar cells take advantage of the unlimited availability of the sun's rays which reaches the planet in every second.

They are readily seen and it has certainly grown to be a part of human's everyday life.

The advantage of photovoltaic is to provide clean-green energy. During electricity generations with photovoltaic panels, there is no harmful greenhouse gas emission; thus, solar photovoltaic is environmental friendly. The solar energy supplied by nature is free and abundant. It can also be available anywhere with the presence of sunlight. Photovoltaic panels through Photo electric phenomenon produced electricity in a direct way. The residential solar panels are easy to install on rooftops or on the ground without any interference to residential life style.

As in renewable energy source, solar energy has intermittency and unpredictability that makes its panels less reliable as a solution. Solar Panel also needs additional equipment such as inverter to convert direct electricity to alternating electricity in order to use the power. It also needs batteries to increase the investment cost for photovoltaic panels considerably. In addition, solar panel cannot be used in rainy and cloudy season. It will not change some sunlight that is needed to generate power supply in the load; thus, making it incapable of doing its work.

Material Needed

Set of Solar Panel (base on the Need of load)
Battery
Electrical Wiring
Inverter
Circuit Breaker
Frame for Solar Panel

Note:

The Total Quality of the Material depend on the Total load required. (Ask for the Professional Assistance for the Design).

SIGNIFICANCE OF THE STUDY

For Institute

This study will help the institute to lessen the consumption of electric bill, make a campus powered by renewable source.

For Environment

This study helps to replace fossil fuel as the major energy source because solar power is renewable at absolutely no cost to supply energy infinitely. Moreover, solar panels are able to harness the energy from the sun and convert it to electricity.

For Future Researcher

The project can serve as an important tool to those who will conduct studies related, learning references by providing information broadening the knowledge in creating better results in the same field study. It also helps the future researchers to improve their project and also, it can serve as a guide to them.

SUMMARY OF FINDINGS

The project was developed through the integration of the different components consisting of the following Solar Panel (REC Solar 265W), End clamp, L – feet, MC4 Connector, Mid Clamp, Rails, Rails splice and Silicon which were mounted in the roof of Industrial Technology Center Building (ITC Bldg).

A part of the study was concerned with the specification and computation of the solar panel to be used, mounting/installing and connecting of the solar panel, description of the project, the tools used and the procedure in the making of the project. It included the working drawing, diagramming and picture specifications, list of materials, steps in operating the project, preventive maintenance, safety and control measure and some trouble shooting techniques to guide the operations.

CONCLUSION

This paper showed the feasibility for the teacher and students of Electrical Technology courses, to compute, mount and install solar panel that can be used in performing the campus street lights and flood alarm. This study provide information regarding the development of solar panel/photovoltaic. The result of this study should serve as a leap toward another technical innovation in line to electrical servicing.

The Campus Street light installed in the College of Industrial Technology was so helpful to the student and Barangay.

On the part of the Administration of the Eulogio “Amang” Rodriguez Institute of Science and Technology may Implement the solar panel to all the Buildings in the Institute and Connect all the lightning system in EARIST.

BIBLIOGRAPHY

https://en.wikipedia.org/wiki/Solarpanel

https://en.wikipedia.org//wiki/Solarcell

https://www.rappler.com/business/imndustrie/173-power-and-energy/31969-renewable-energy-is-sustainable-competitive-study

https://opinion.inquirer.net/97095/case-ph-transition-solar-energy

https://wwwnwwindandsolar.com/solar-power-in-seattle-and-the-northwest/how-do-solar-systems-produce-energy/

https://www.dlsu.edu.ph/library/pathfinder/eng-tech/solar-energy.asp

https://www.ashden.org/sustainable-energy/ashden-guides/solar-for-the-grid?gclid=EAIaIQobChMIuKXBmbnR1gIVgp09Ch3P6g4GEAAYAiAAEgJhOPD-BwE

https://www.vivintsolar.com/learning-center/how-does-solar-power-work

https://www.vivintoslar.com/learning-center/what-is-net-metering

E-LEARNING FOR OPERATING SYSTEM

Gerlyn M. Domingo
Eleanor M. Gonzales
Cecilia B. Surio

INTRODUCTION

Nowadays technology is inevitably advancing and its application in the classroom instructions remains to be significant when Information and Communication Technology (ICT) is integrated into the education system. More recently the use of electronic learning or e-learning has been used as one of the instructional teacher strategy in the educational sector and globally. Educationists throughout the world were largely in support of the use of e-learning because they think it is best suited for the demands of the students of today.

According to Wikipedia (2011) in Ugwuanyi (2012) stated that E-learning emerged as an offshoot of distance learning. Distance learning carried with it some roles and responsibilities for both the teacher and the students. With the use of e-learning, EARIST as one of the State Universities and Colleges (SUC's) may extend its support to less fortunate students, working students, student-parents, etc.

The giving of lectures and hand-outs in the classroom by instructors physically to students has been traditional yet despite of the flourishing modern technology, it is still implemented. Nevertheless the demands of the competitive world today need not only physical presence of instructors but also the adoption of ICT using e-learning as a new teaching strategy. It is from this premise that the researchers were motivated to conduct this study "e-learning in OS" which aimed to help the students and instructors to access the lessons and topics through vicarious multimedia presentation .

CONCEPTUAL FRAMEWORK

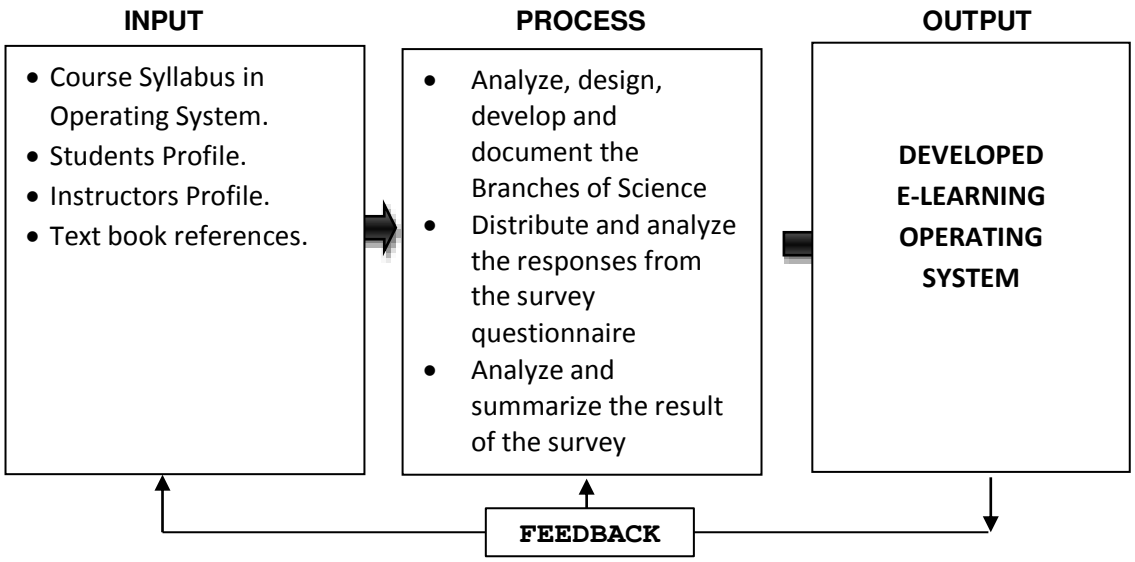


Figure 1. Research Paradigm

The framework of the study is presented in Figure 1. It is guided by the model input, process and output (IPO).

The Input (I) of the system includes the Course Syllabus in Operating System also Students Profile, Instructors Profile and Text book references.

The Process (P) are data gathering that includes collecting data and interviewing, then the development of E-Learning for Operating System includes also the designing and programming. Lastly, are statistical analysis and interpretation of data.

The Output (O) of the study, the researchers developed a system entitled "E-Learning for Operating System".

RESEARCH AIM AND QUESTIONS

The main purpose of the study was to develop e-learning for Operating System subject.

Specifically, it sought to answer the following questions:

1. How effective is e-Learning in the teaching and learning of Operating System of the respondents?

2. What are the features of the developed E-learning for Operating System?

3. What are the respondent's levels of acceptance in the developed e-learning for Operating System in terms of the following:

   3.1 Performance Effectiveness;

   3.2 Performance Efficiency;

   3.3 User Interface Design;

   3.4 Flexibility;

   3.5 Accuracy;

   3.6 Security Options; and

   3.7 Help Options?

METHODOLOGY

Research Design

A descriptive-developmental method was used as the research design on the development of the system. This is a suitable method that focused on identifying the conditions and present practices as they exist at the time of research.

Population and Sampling

To determine the acceptability of e-Learning for Operating System, Quota sampling technique of the non-random sampling method was used by the researchers. These comprised a total of 160 respondents composed of BSCS, BSCT, IT Experts, and End Users.

Instrumentation

In order to gather as much information and relative evaluation, the researcher utilized data gathering instruments such as interviews, readings of related literature and questionnaires as main instruments used. The instruments were validated by two IT experts from Industry, Practitioner and Four IT professors from the Computer Department.

The Likert scale was used to identify the computed value on the level of acceptability of the developed system as shown below:

Numerical Scale of Evidence	Verbal Interpretation	Range
5	Highly Acceptable	4.50 -5.00
4	Very Acceptable	3.50 -4.49
3	Acceptable	2.50 -3.49
2	Less Acceptable	1.50 – 2.49
1	Not Acceptable	1.49 – 1.00

Data Analysis

Data were analyzed, tabulated and presented through tables. The study applied the statistical measures deemed appropriate in the presentation and interpretation of the data generated from the study. Sets of criteria were constructed using descriptive statistics which are percentage and weighted mean to determine the respondents' perception on the degree of acceptability of the system.

RESULTS AND DISCUSSION

1. How effective is e-Learning in the teaching and learning of Operating System of the respondents?

Table 1

Effectivity of e-Learning in the Teaching and Learning of Operating System

Criteria	Faculty		Students		Combined Weighted Mean		Rank
	WM	VI	WM	VI	WM	VI	
It can be applied in updating and developing the content.	4.45	VA	4.33	VA	4.39	VA	5
Suitable to the lesson presented.	4.33	VA	4.16	VA	4.25	VA	7
Topics are presented logically.	3.60	VA	4.0	VA	3.80	VA	8
Provide adequate /accurate ideas and information.	4.52	HA	4.57	HA	4.55	HA	2
Helps enrich the knowledge of the students on the concept being discussed in the lesson.	4.50	HA	4.50	HA	4.50	HA	4
Encourages the use of multi-media presentation.	4.50	HA	4.53	HA	4.52	HA	3
Contents as a whole stimulate student's interest.	4.16	VA	4.56	HA	4.36	VA	6
Can be studied at one's convenient time and place.	4.60	HA	4.66	HA	4.63	HA	1
Composite Mean	4.33	VA	4.41	VA	4.37	VA	

Table 1 presents the Effectivity of e-Learning in the Teaching and Learning of Operating System. Can be studied at one's convenient time and place got the highest rating of 4.63, Provide adequate /accurate ideas and information got 4.55, Encourages the use of multi-media presentation got 4.52, all interpreted as Highly Acceptable. While It can be applied in updating and developing the content got 4.39, Contents as a whole stimulate student's interest got 4.36, Suitable to the lesson presented got 4.25, and Topics are presented logically got 3.80 with verbal interpretation of Very Acceptable. Findings show that the system is Very Acceptable with a 4.41 composite mean.

2. What are the features of the developed e-learning for Operating System subject?

The features of the developed e-learning for Operating System subject are the following: Sign in form, Home, School Year, Forum, Announcement, Assessment, and Reports.

Figure 2. Sign in Form and Navigation Pane

Figure 2 shows Sign in and Navigation Pane of the System.

Figure 3. Home Menu

Figure 3 shows Home menu which includes the Lessons, Tutorial, and Students.

Figure 4. School Year Menu

Figure 4 indicates School Year and list of students per semester.

Figure 5. Forum Menu

Figure 5 displays the forum where both faculty and students can communicate or exchange ideas.

Figure 6. Announcement Menu

Figure 6 exhibits Announcement of the faculty.

Figure 7. Assessment Menu

Figure 7 gives Assessment for the students learning.

Figure 8. Reports Menu

Figure 8 offers Reports for Activity Logs, List of Students and their Assessment Result.

3. What are the respondents level of acceptance in the developed E-learning for Operating System in terms of the following:

3.1 Performance Effectiveness

Table 2

Level of Acceptance of the e-Learning for Operating System in terms of Performance Effectiveness

Performance Effectiveness	End-User	IT Experts	Students	Weighted Mean	Verbal Interpretation	Ranking
Able to perform all required tasks.	4.65	4.20	4.43	4.43	Highly Acceptable	1
Able to perform all tasks that maybe desired in the future.	4.31	4.40	4.26	4.32	Highly Acceptable	3.5
Well-designed appropriateness of display screens.	4.38	4.40	4.23	4.34	Highly Acceptable	2
Adequate capacity to perform the required tasks.	4.50	4.20	4.26	4.32	Highly Acceptable	3.5
Composite Mean	**4.46**	**4.30**	**4.30**	**4.35**	**Highly Acceptable**	

3.2 Performance Efficiency

Table 3

Level of Acceptance of the e-Learning for Operating System in terms of Performance Efficiency

Performance Efficiency	End-User	IT Experts	Students	Weighted Mean	Verbal Interpretation	Ranking
Fast response in time.	4.31	4.60	4.35	4.42	Very Acceptable	2
Efficient input.	4.35	4.20	4.45	4.33	Very Acceptable	3
Efficient output.	4.38	4.60	4.32	4.43	Very Acceptable	1
Efficient Backup.	4.50	3.80	4.20	4.17	Very Acceptable	4
Composite Mean	**4.39**	**4.30**	**4.33**	**4.34**	**Very Acceptable**	

Table 3 presents the Performance Efficiency of the system as evaluated by the respondents. All of the criteria had a verbal interpretation of Very Acceptable. Efficient Output obtained the highest mean of 4.43. This is followed by Fast Response in Time with a weighted mean of 4.42, while Efficient Backup attained the lowest weighted mean of 4.17. The overall mean is 4.34, verbally interpreted as Very Acceptable.

3.3 User Interface Design

Table 4

Level of Acceptance of the e-Learning for Operating System in terms of User Interface Design

User Interface Design	End-User	IT Experts	Students	Weighted Mean	Verbal Interpretation	Ranking
Focus on basic Objectives.	4.73	4.60	4.43	4.59	Highly Acceptable	1
Build an interface that is easy to learn.	4.46	4.60	4.30	4.45	Very Acceptable	4
Provides features that is easy to learn and use.	4.46	4.40	4.28	4.38	Very Acceptable	5
Make it easy for users to obtain help or correct errors.	4.58	4.20	4.28	4.35	Very Acceptable	7
Minimize input problems.	4.42	4.00	4.22	4.21	Very Acceptable	8
Provide feedback to users.	4.54	4.40	4.16	4.37	Very Acceptable	6
Attractive layout and design	4.38	4.80	4.26	4.48	Very Acceptable	3
Use familiar terms and images.	4.58	4.80	4.21	4.53	Highly Acceptable	2
Composite Mean	**4.52**	**4.48**	**4.27**	**4.42**	**Very Acceptable**	

Table 4 displays the User Interface Design of the system as evaluated by the respondents. Focus on Basic Objectives got 4.59 and Use Familiar Terms and Images got 4.53 weighted mean of 4.59 with verbal interpretation of Highly Acceptable. Meanwhile six criteria got a verbal interpretation of Very Acceptable.

3.4 Flexibility

Table 5

Level of Acceptance of the e-Learning for Operating System in terms of Flexibility

Flexibility	End-User	IT Experts	Students	Weighted Mean	Verbal Interpretation	Ranking
Option are available for input	4.50	4.40	4.39	4.43	Very Acceptable	3
Option are available for output	4.42	4.40	4.16	4.33	Very Acceptable	5
Attains the accuracy of the output	4.50	4.40	4.26	4.39	Very Acceptable	4
System indicates the needed information	4.65	4.60	4.35	4.53	Highly Acceptable	1
Output can be displayed and viewed	4.46	4.80	4.26	4.51	Highly Acceptable	2
System can be moved from one computer to another	4.62	3.60	4.23	4.15	Very Acceptable	6
Composite Mean	**4.53**	**4.37**	**4.28**	**4.39**	**Very Acceptable**	

Table 5 represents the computed data for Flexibility of the system. Based on the computed values, the System indicates the needed information got the highest mean of 4.53, with a verbal interpretation of Highly Acceptable. System can be moved from one computer to another got the lowest weighted mean of 4.15 with a verbal interpretation of Verbal Acceptable. Based on the findings, the respondents evaluated the system with composite mean of 4.39 with a verbal interpretation of Very Acceptable.

3.5 Accuracy

Table 6

Level of Acceptance of the e-Learning for Operating System in terms of Accuracy

Accuracy	End-User	IT Experts	Students	Weighted Mean	Verbal Interpretation	Ranking
System is capable to do computations when needed.	4.46	4.85	4.08	4.46	Very Acceptable	2
System has options for editing or updating of information based on user's requirements	4.63	4.70	4.11	4.48	Very Acceptable	1
Composite Mean	**4.55**	**4.78**	**4.10**	**4.47**	**Very Acceptable**	

Table 6 shows the evaluation of respondents on Accuracy of the system. System has options for editing or updating of information based on user's requirements s got 4.48 and System is capable to do computations when needed got 4.46 both having a verbal interpretation of Very Acceptable.

3.6 Security Options

Table 7

Level of Acceptance of the e-Learning for Operating System in terms of Security Options

Security Options	End-User	IT Experts	Students	Weighted Mean	Verbal Interpretation
Provides security options	3.54	2.80	3.48	3.27	Acceptable

As reflected in Table 7 the respondents assessed the security option as Acceptable based on the weighted mean of 3.27.

3.7 Help Menus

Table 8

Level of Acceptance of the e-Learning for Operating System in terms of Availability of Help Menus

Help Menus	End-User	IT Experts	Students	Weighted Mean	Verbal Interpretation
Availability of Help Menus	4.42	3.80	4.09	4.10	Very Acceptable

Table 8 presents the Help Menus of the system. Availability of Help Menus got a weighted mean of 4.10 with verbal interpretation of Very Acceptable.

Table 9

Summary on the Level of Acceptance of the Level of Acceptance of the e-Learning for Operating System

Criteria	End-User	IT Experts	Students	Weighted Mean	Verbal Interpretation	Ranking
Performance Effectiveness	4.46	4.30	4.30	4.35	Very Acceptable	4
Performance Efficiency	4.39	4.30	4.33	4.34	Very Acceptable	5
User Interface Design	4.52	4.48	4.27	4.42	Very Acceptable	2
Flexibility	4.53	4.37	4.28	4.39	Very Acceptable	3
Accuracy	4.55	4.78	4.10	4.47	Very Acceptable	1
Security Options	3.54	2.80	3.48	3.27	Acceptable	7
Help Menus	4.42	3.80	4.09	4.10	Very Acceptable	6
Grand Mean	**4.34**	**4.12**	**4.12**	**4.19**	**Very Acceptable**	

Table 9 reveals the summary of evaluation of respondents on the level of acceptance of e-Learning for Operating System. The Accuracy got the highest rating of 4.47. While User Interface Design got 4.42, Flexibility got 4.39, Performance Effectiveness got 4.35, Performance Efficiency got 4.34, Help Menus got 4.10, and Security Options got 3.27 with verbal interpretation of Very Acceptable. Findings show that the system is Very Acceptable with a 4.19 grand mean.

CONCLUSION

1. The developed E-learning is very acceptable and can be and can be utilized by student taking up Operating System subject. It includes the development of multimedia instructional materials which is in line with the vision of ICT – to integrate completely the ICT into the curriculum.

2. The e-learning can be considered as supplementary aid/help for both faculty and students especially when the time and place are unavailable.

3. The assessment of the respondents of the developed e-learning was very acceptable.

RECOMMENDATIONS

1. The e-learning maybe adequately planned for and introduced gradually at the tertiary level.

2. Other researchers may conduct further evaluation on the effectiveness of the e-learning.

3. The researchers recommend other researchers to undergo enhancement of the e-learning based on the level of effectiveness.

4. The e-learning can be recommended for use as supplementary aid/help for both faculty and students on appropriate situation.

BETEL NUT, ANNATTO AND TURMERIC EXTRACTS AS INK IN HIGHLIGHTER PEN: ITS DEVELOPMENT AND CHARACTERISTICS

Evelyn A. Gabas
Ariel E. Tobias

I. INTRODUCTION

Highlighter is an active pen that allows users to highlight directly onto the paper or surface of a highlight keyword such as books, reviewer, or other important sources. It is differ from active pens which are typically used for note taking, document annotation, as well as highlight object selection. A Highlighter is variant of felt-tip pen with water-based ink that is used to marked important parts of the texts or parts become visible and easier to find. It is indispensable tools for school and work. Like blazes on a trail, they mark important information and point us in the right direction. Highlighters marked parts become more visible and easier to find.

The awareness of people today on the use of chemicals made them experiment and develop products which will not harm human and the loving nature. From this, they made use natural coloring that can be used as ink in highlighter pen.

Betel nut is popular for chewing throughout to some Asian countries. The extract of betel nut may be addictive and produces yellow color that can be used as ink.

Turmeric (curcuma longa) is a rhizomatous herbaceous perennial plant of ginger family. The plant produces fleshly bright yellow to orange in its roots system, does used for flavoring, food preservative and food coloring agent.

Annatto and its extracts are now widely used in artisanal scale as coloring as a coloring agent in many process food products such as cheeses, dairy spreads, butter and margarine, baked goods, snacked goods, baked cereals, meat and fish sausages and more. In these uses annatto is a natural alternative to a synthetic food coloring compounds.

From this context, the researchers conducted this study to help minimize the use of toxic solvent and inorganic synthetic colorant/ink used in processing product such as highlighter to help the country in promoting the advocacy of using organic material for product development.

1.1 Statement of the Problem

This study wished to discover the efficiency of Betel nut, Annatto and Turmeric Extracts as Ink in Highlighter pen.

Specifically, it sought to answer the following sub-problems:

1. What are the materials ingredients, tools apparatuses and procedures in the development of Betel nut, Annatto and Turmeric Extracts pen Highlighter?

2. How do the respondent asses the acceptability of Betel nut, Annatto and turmeric extracts Highlighter Pen in the following:

2.1 Evenness of color;
2.2 smearing;
2.3 drying time; and
2.4 odor?

3. Is there a significant difference on the evaluation of the selected respondents as to the acceptability of Betel Nut, Annatto and Turmeric Extracts as highlighter pen.

4. What is the usability test result of Betel Nut, Annatto and Turmeric Extracts as Highlighter Pen from the Adamson University Technology Research and Development Center?

1.2 Hypotheses

This study is guided by the hypothesis that there is no significant difference on the assessment of the group of respondents as to the acceptability of Betel Nut, Annatto and Turmeric Extracts Highlighter Pen.

1.3 Conceptual Framework of the Study

The conceptual framework discussed the flow of the study. The study used IPO model which is composed of input which went through the process and emerged as the output.

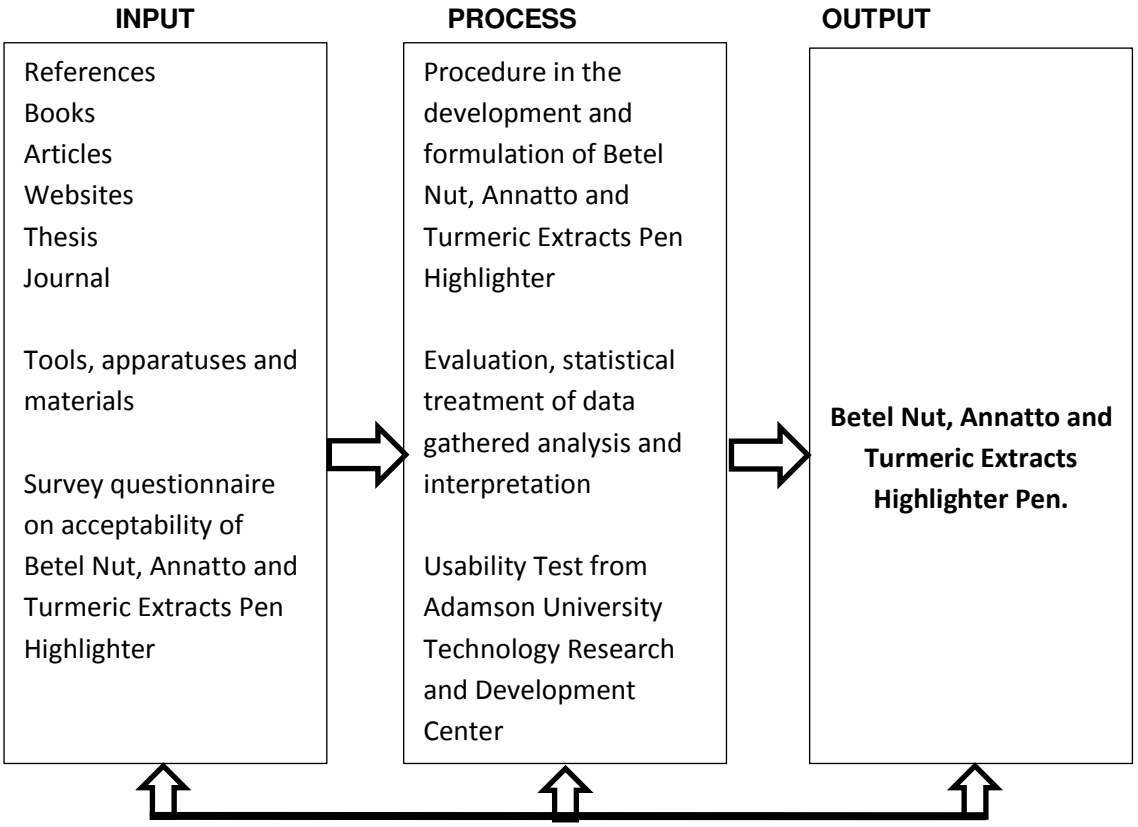


Figure 1. Research Paradigm

This research used the Input-Process-Output (IPO) model of the study to a certain possible outcome of the investigation.

The Input consists of books, journals, periodicals, internet websites; tools needed, apparatuses and materials; survey questionnaire used is the evaluation of criteria.

However, the Process (P), contains the procedure in the preparation of Atsuete and Betle Nut Pen Highlighter; gathering of data through survey questionnaire; Usability test; statistical treatment of data; analysis and interpretation of data.

Finally, Output (O) of the study is the Betel Nut, Annatto and Turmeric Extracts Highlighter Pen.

1.4 Significance of the Study

The researchers' wishes to share this piece of work to the Institution and believed to be significant to **Industrial Chemistry Students** because this can be used as reference to those who wish to continue or enhance the study, to the **Faculty,** for the result of this study can be set as reference.

Motivation for similar research and encourage them to promote the use of natural materials in the development of new product and Entrepreneur, for the viability result of the study can be an investment for them to mass produce product as variant for local or international market.

II. RELATED LITERATURE

The permanent marker or indelible marker is a type of marker pen that is used to create permanent writing on an object. In general, the ink compromises a main carrier solvent, a glyceride, a pyrrolidone, resin and a colorant, making it waterproof. It is capable of writing on a variety of surfaces from paper to metal to stone. They come in a variety of tip sizes shapes (chisel point, bullet tip, and wide bristle), and color. (Like spray paint, these markers contain volatile organic compounds which evaporate to dry the ink. Permanent marker is another name for "waterproof" marker. (1) The ink is a liquid pigmented substances used for writing and printing or even for drawing purpose. For which of is used; All ink, however contain 2 or more rudimentary components a pigmented or dye called a colorant and vehicle, a liquid form into which the colorant is dispersed for. Many Inks differ from the paint only in the purpose which they are used. Ink is one of the most important components of marker. Without Ink, marker is useless. (2) The production of natural food coloring from alugbati seed was investigated base on the quality compared to commercial food coloring. The food coloring was produced by following the method of heating, extracting and filtration. The finished product was then tested for quality through survey method includes odor and color. As based on the results the alugbati seed can be made into a food coloring and can be potential source of food coloring production. The food coloring produced from alugbati seed following an easy steps, the food coloring was observed to be violet in color and pure I odor. The result of the survey was food coloring-like in odor. It is a environment-friendly because the material used was natural compare to the commercial one, this produce product from alugbati seed has a great advantage to the commercialized. (3) The feasibility of using indigenous ink in producing quality highlighter inks. Three plants were chosen as sources of ink- the San Francisco leaf, flower of the gumamela, or shoeflower, and the luyang dilaw, or yellow ginger, or turmeric (Curcumalonga). Ink with different ratios of dye (solute) to water (solvent) was produced. The solutions were tested on

paper. A survey was done on which treatment students preferred. The samples were judged based on a set of criteria which included evenness of color, drying time, smearing, odor, and texture of paper making. It was also observed that in some criteria, such as odor and smearing, the ink that was produced using indigenous ink was considered acceptable. It was then concluded that indigenous ink could be used to produce highlighter inks, though some improvement could still be made in the production of the ink. (4)

2.1 Synthesis of the Study

The aforementioned literature and studies provided by the researcher gives backgrounds and information on the uses of natural extracts. The color produce from the extracts of plants (3,4) was convincingly as effective and as beautiful as the synthetic that were used as food colorant and ink for pens.

III. METHOD OF RESEARCH

3.1 Research Design

This study made used of the descriptive method which highlights its purpose, methods and other facts regarding the study. The descriptive method is considered appropriate since the process seek to gather describe, analysis and interpret data. (Donovan, 2009).

The researchers administered the questionnaire to selected respondents to identify their age, sex, and other demographic profile characteristics, evaluate the preparation of Highlighter Pen and determine the level acceptability be selected respondents.

3.2 Sample and Procedure

This research utilized fifty (50) respondents which composed of two groups such as forty (40) consumers from different schools and universities and Ten (10) Experts like Quality Assurance Inspector from different Ink and Highlighter Manufacturing Company to assessed product. The product was also subjected for usability testing procedures which would be done in the Adamson University Technology Research and Development Center.

Procedures in the preparation of Betel Nut, Annatto and Turmeric Extracts Highlighter Pen

1. Prepare all ingredients used in the preparation of Betel Nut, Annatto and Turmeric Extracts Pen Highlighter as shown in Figure 2.

Figure 2. Preparing the materials

2. Wash the Annatto and Betel nut and turmeric, then remove the peel as shown in Figure 3.

Figure 3. Removing he peel of Betel nut

3. Combine the extracts of annatto and betel nut as shown in Figure 4.

Figure 4. Extracting the fruits

4. Add Glycerine and Deo alcohol to the extracted juice of annatto and betel nut as shown on Figure 5.

Figure 5. Adding glycerine and deo alcohol to the extracts

5. Transfer the ink into the Barrel in 30=45 minutes until full the empty barrel as shown in Figure 6.

Figure 6. Transfering the ink into empty barrel

6. Labelas of Betel Nut, Annatto and Turmeric Extracts Pen Highlighter.

Figure 7. Finished Product

3.3 Statistical Treatment of Data

The data gathered were tallied, categorized and subjected to descriptive analysis. The descriptive measures used were frequency distributions, percentage and weighted mean and arbitrary values. Frequency distribution was used to show the responses of the respondents under the different categories.

The responses for the different categories were presented in relative distribution or percentage using the following formula:

$$P=f\ Fx\ 100\%$$

Where: P=Percentage
F=Frequency
F=Total frequency of all categories

The study also made use of the T-Test. T-Test was used to compare the means of the two samples (students and Faculty). In simple terms, The T-Test compared the actual difference between the two means in relation to the variation in the data (expressed as the standard deviation between the means).

The T-Test formula was utilized wherein:

$$T=|x_1 - x_2| \div \sqrt{AxB}$$

Where:

$$A = (n_1 + n_2) \div n_1\ n_2$$

and

$$B = [(n_1 - 1)s_1^2 + (n_2 - 1)\ s_2^2] \div [n_1 + n_2 - 2\ ]$$

Likert Scale. To interpret the perception of the respondents as to acceptability of Betel Nut, Annatto and Turmeric Extracts Highlighter Pen the five-point Rating Scale was used with the following equivalent points.

Options	Verbal Interpretation Equivalent Point
5	Highly Acceptable (HA) 4.20-5.00
4	Acceptable (A) 3.0-4.19
3	Moderately Acceptable (MA) 2.60-3.39
2	Least Acceptable (LA) 1.80-2.59
1	Not Acceptable (NA) 1.00-1.79

IV. RESULT AND ANALYSIS

How do the respondents asses the acceptability of highlighter based on the evenness of color, smearing, drying time, and odor?

Assessment of Respondents on the Level of Acceptability of Betel Nut, Annatto and Turmeric Extracts Highlighter Pen

CRITERIA	Expert		Consumer		Overall		Rank
	WM	VI	WM	VI	WM	VI	
1. Evenness of color	3.70	A	4.20	HA	3.95	A	4
2. Dying Time	4.20	HA	4.20	HA	4.20	HA	1
3. Smearing	3.80	A	4.13	A	3.97	A	3
4. Odor	4.20	HA	3.95	A	3.97	A	2
Overall Weighted Mean	**3.98**	**A**	**4.12**	**A**	**4.05**	**A**	

Option	Range Value	Verbal Interpretation	Symbol
5	4.20-5.00	High Acceptable	HA
4	3.40-4.19	Acceptable	A
3	2.60-3.39	Moderately Acceptable	MA
2	1.80-2.59	Least Acceptable	LA
1	1.00-1.79	Not Acceptable	NA

As presented by the data, both expert and consumer respondents indicate all the variables under the level of acceptability of Betel Nut, Annatto and Turmeric Extracts Highlighter Pen as acceptable; rank 1, Dying time with obtained composite weighted mean of 4.20; rank 2, Odour with obtained composite weighted mean of 4.08; rank 3, Smearing with obtained composite weighted mean of 3.97; and rank 4, Evenness of color with obtained overall weighted mean of 3.97; and rank 4, Evenness of colour with obtained overall weighted mean of 3.95.

The results indicate that the level of acceptability of Betel Nut, Annatto and Turmeric Extracts Pen Highlighters was acceptable to both expert and consumer respondents in terms of evenness of colour, dying time, smearing, odour supported by the obtained overall weighted mean value of 4.05.

Results of Significant Difference on the Level of Acceptability of Betle Nut, Annatto and Turmeric Extracts Highlighter Pen

Criteria	Mean	Standard Deviation	t-ratio Computed t value	VI	Decision
Expert	3.98	0.23	2.000	Accept Ho	Not Significant
Consumer	4.12	0.10			

Critical Value of t at 0.05=2.014
Degree of freedom=48

Looking at the result of the statistical treatment, it could be noticed that the expert obtained a weighted mean of 3.98 and a standard deviation of 0.23 while the consumers obtained a weighted mean of 4.12 and a standard deviation. When this obtained values was subjected to statistical analysis, it obtained a computed t value of 2.000 at five percent level of significant with 48 degrees of freedom to the critical value of 2.014 resulted to the acceptance of null hypothesis and verbally interpreted a not significant.

Since we accept the null hypothesis, there is a strong evidence that there is no significant difference between the assessment of the experts and consumers as to the level of acceptability of Betle Nut, Annatto and Turmeric Extracts Pen Highlighter in terms of evenness of colour, dying time, smearing and odour.

What is the usability test result of Astute and Betel Nut Highlighter Pen sent to Adamson University Technology Research and Development Center.

Based on the Usability test sent to Adamson University Technology Research and Development Center, the result is as follows.

Analytes/Parameters	Result	Units	Methods
Usability Testing	Successfully met Standard of Usability Testing	-----	Prototype Testing

Remarks:

As per sample(s) received and may not be used for legal purposes, The report shall not tbe reproduced except in full and with written approval of the AUTRDC.

The result above signifies that the Betel Nut, Annatto and Turmeric Extracts Highlighter Pen conceived and successfully met the usability testing and met the standards.

V. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Betel nut, Annatto and Turmeric extracts can be used as colorant in a highlighter pen. The Betel Nut, Annatto turmeric extracts Highlighter Pen has to be packed in a proper packaging material. It is recommended for a mass production for the college or institution as income generating product.

REFERENCES

Blair (2008), page 32 “Pen-Highlighters”

Almonte(2013) (Investigatory project regarding the use of alugbati berry seed juice as marker ink)

Amos (2010) (marker pen use to create permanent writing on an object)

(3)Oliver, (2012) Alugbati oink. Retrieved from: www.academia.edu/15111945

(4)Lopez, (2013) Jetpens. Retrieved www.jetpens.com/blog/highlighter-pens-comprehensive-guide/pt/606

(4)Antioquia, (2008) investigation on marker. Retrieved from https//www.researchgate.net/publication/259129159_raman_investigation_markers_pen_inks

(2)Balane (2015) Invisible ink. Retrieved from http://onlinelibrary.wiley.com/doi/10.1002/anie.201001308/full

Amos, (2010) indelible marker. Retrieved from https://www.research.netpublication/259129159 Deocampo (2011) The use of indigenous plants as alternative pigment for highlighter ink. Retreived from http://scinet.dost.gov.ph

LEVEL OF COMPUTER SKILLS ACQUIRED BY PHYSICAL SCIENCE PRE–SERVICE TEACHERS: BASIS FOR AN ICT BASED TRAINING PROGRAM

Benjamin G. Haboc
Florinda D. Bautista
Cristina E. Soriano
Dennis D. Mangubat

I. INTRODUCTION

A tremendous force in the 21st century is the so – called technology for it influence every field of endeavor. It has an everyday routinary tool to all kinds of people in all walks of life. Thus, it enforces people to change.

Each person has to adapt himself according to the technological innovations existing at present. It created a new social dimension particularly in the field of communication. Chauve (2003) reiterated that new skills are required for all. In the communication society, it is vital to be able to search for, sift, select and process information, in all forms, including that available from multimedia sources. It is therefore essential to be able to read and interpret "images". However, we also need to know how to produce information. As communication cannot be reduced to the production of the written word, an understanding of basis means of communicating via the media is essential. However, we must not neglect other forms of expression such as painting, theatre, dance and music, because ICTs [Information and Communication Technologies] alone will not suffice to foster, express and share the richness and diversity of human creativity. Digital literacy is part of new skills of communication society. It defined as abilities and skills required to able to use ICT in daily life and job conditions. Digital literacy altered responsibilities of schools. Schools have to be made students and other members of the society as digitally literate. Also Davis (1997) stated that teachers had a vital role to apply information and communication technologies so that all persons acquired required skills and knowledge of communication society. She continues that the development of teachers in IT and suitable pedagogical skills are critical.

On the other hand, Martinson (1998) pointed out that teachers are required to not only guarantee their students' understanding of the new communication technologies to improve their lives but also indicate negative consequences of new technologies from both individual and societal circumstances. He also mentions that what teachers needed to know about communication technologies and proposes that "teaching about the new media technologies requires that the teachers know something more than nuts and bolts of the process…" (p. 152).

Similarly, Rowe (1998) illustrated that some students quite frequently were more competent computer user than teachers and this condition affected teacher negatively. He added that if teachers were not well trained about technology and its utilizations, they behaved computers as scary monsters. This illustrative case is another superior evidence for the importance of teacher training programs.

1.1 Statement of the Problem

This study aimed to determine the level of computer skills acquired by pre – service teachers as basis for an ICT Based Training Program for Physical Science major students.

Specifically, the study sought to answer the following sub - problems:

1. What are the profiles of the respondents in terms of:

1.1 Age;

1.2 Gender;

1.3 Computer Ownership;

1.4 Internet access; and

1.5 Length of computer exposure?

2. What are the levels of computer skills acquired by pre – service in terms of:

2.1 Technology Use in Educational Environments;

2.2 Basic Computer Skills; and

2.3 Advanced Computer Skills?

3. Is there a significant relationship between the level of the computer skills acquired and the profile of the respondents?

4. Based from the result, what ICT Based training program for physical science pre – service teachers be developed?

1.2 Conceptual Framework

Based on the discussions, the present study made use of the INPUT, started from getting the profile of the pre – service teacher, then conducting a survey on the levels of computer skills acquired by the respondents then PROCESS, included the research instrument in gathering the data as to: survey questionnaire, statistical treatment of data and analysis and interpretation of data. The last is OUTPUT, the results in the study an ICT Based Training Program for a pre – service teacher physical science major.

The conceptual paradigm as conceptualized by the researchers is presented in Fig. 1. The flow of the study is shown in the paradigm below:

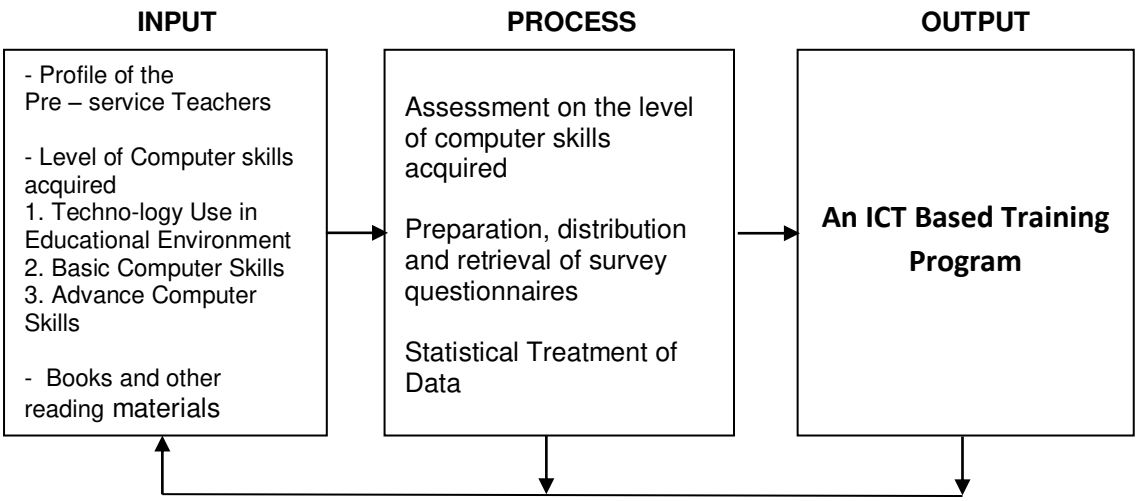


Fig. 1 Conceptual Paradigm

1.3 Objectives of the Study

This study aimed to determine the level of computer skills acquired by pre – service teachers as basis for an ICT Based Training Program for Physical Science major students.

Specifically, the researcher aim to:

1. To identify the levels of computer skills acquired by pre – service in terms of:

    1.1 Technology Use in Educational Environments;

    1.2 Basic Computer Skills; and

    1.3 Advanced Computer Skills

2. To determine if there's a significant relationship between the level of the computer skills acquired and the profile of the respondents?

3. Based from the result, develop an ICT Based training program for physical science pre – service teachers

1.4 Significance of the Study

This study proved to be beneficial to the following stakeholders:

College of Education Physical Science Student – The result of the study may enhance their learning in science concepts.

Science Teachers - The findings may help the teachers to change their way of teaching and their beliefs, concepts and attitudes towards science teaching and learning.

Science Coordinators - The output of the study may facilitate supervisors of the teaching-learning process in science subject.

Administrators - The administrator may be able to provide support on faculty development programs terms of trainings and seminars on teaching and learning.

Future researchers - The future researchers may gain insight from the research study and conduct further research on teachers' characteristics.

II. REVIEW OF THE LITERATURE and STUDIES

Because of changing society and its huge amount of new demands, teacher education institutions have to support their curriculum with introductory technology courses. Technological innovations had been crucial impact on definition of content of the courses. Betrus and Molenda (2002) summarized that technology courses play especially serious role in teacher education but there is a gap between what the things taught and what the real things utilized in schools. From the historical development, it can be concluded that the introductory technology courses always are in charge of changes due to rapid development of technologies. Today, the most powerful technology is computer so the technology courses give more attention on computer technologies and their usage in educational environments. In future, another

technological tool definitely will enforce technology courses to change. Also, rapid developments resulted with many tried technology integration models in teacher education.

Teacher training institutions are in adaptation process to meet current standards of information and communication society. They reorganize their curriculum and as well as their goals with respect to different aspects, which is the way of technology infusion into schools, the characteristic of curriculum, the teacher training system, and socio-political philosophy of the role of schools and teachers (Aufenanger & Yildirim, 2003). At this point, goals of teacher training institutions have critical roles. In the literature, there are a number of goals recommended for teacher training institutions for information and communication society. For example, Niederhauser (2001) declared that "the ultimate goal of technology in teacher education is to enable K-12 teachers with necessary skills and understandings so they can provide a technology-rich learning experience for their students." (p. 3).

Kennedy's proposal was more concentrated on computer programming. However, it neglected pedagogical part of technology use skills. Makrakis (1997) reported that the most of information and technology instructors in universities are from the field of computer sciences without any pedagogical and educational computing background. Hence, the content of the technology course(s) were based on more technical aspects of technological tools. This condition caused dissatisfaction of students towards the technology training programs in teacher education. Therefore, Kennedy's skills could be resulted in some problems in teacher training.

In contrast, Davis (1992) mentioned necessary skills based on effective use of technology in educational environments rather than computer programming. Furthermore, he affirmed that pre service teachers should be able to: 1. "make confident use of a range of software packages and information technology devices appropriate to their subject specialism and age range; 2. review critically the relevance of software packages and information technology devices appropriate to their specialism and age range and judge the potential value of these in the classroom; 3. make constructive use of information technology in their teaching and in particular prepare and put into effect schemes of work incorporating appropriate uses of information technology.

Kynigos (2003) mentioned some elements, which can be explained in addition to OTA's report, should be integrated into teacher training. These are: (a) supporting life-long learning as a part of teacher professional development, (b) concentrating on educational issues rather than technical aspects of technology, (c) considering current schools conditions, (d) investigating, preparing, utilization of alternative materials, resources and tools to work with curriculum-based knowledge and content, and (e) developing understanding of diverse roles of technology such as learning tool, personal tool, educational software and material development tool, personal administrative tasks tool, medium tool for communication and using information, medium for participating forum either colleagues or with students.

Wilkerson (2000) proposed a technology integration approach. It has three areas of technology infusion, that is, communication, productivity, and research/instruction. Wilkerson explained communication area as appropriate technology utilization to facilitate communication between and among various groups involved in teacher training program. E-mail and video conferencing could be used as tools to interact pre-service teachers, instructors, and curriculum experts. He also continued to describe productivity area as personal productivity and support of instruction. The last area is research/instruction component addressing use of technology for research and instruction. Wilkerson concluded that a program including these three areas could fulfill the challenge of preparation of pre-service teachers for effective utilization of technology for instruction.

Moreover, Willis and Mehlinger (1996) explained two types of technology integration in their review about information technology in teacher education: (a) the stand-alone educational computing course, and (b) technology and the method courses. In the stand-alone courses, most of the strategies were explained based on behavioral models such as programmed instruction. In contrast to stand-alone courses, the underlying theory of integrating technology into method courses was constructivist theory. They also mentioned the importance of utilization of technology knowledge and skills by student-teachers during their practice teaching. Except for these two integration models, there is an innovate model to improve effectiveness of technology training. It can be named as field-base technology training model or job-embedded learning (Loucks-Horsley, Hewson, Love, & Stiles, 1997, as citied in Brush et al, 2001).

2.1 Synthesis of the Study

This model might differ from one institution to another institution with respect to implications but it has common goals providing pre-service teachers with technology training in real teaching situations. Brush et al. (2001) mentioned that "the model moves beyond the idea of integrating technology training into teaching method courses; in contrast, pre service teachers learn to integrate technology into their teaching as part of field-based experiences in real classrooms". There are vast amount of studies related to these integration models in the literature. It is important to review some of these studies.

III. METHODOLOGY

This chapter presents the research design, the research locale, the sample and sampling technique, the instruments, the data gathering procedure, and the statistical treatment of the data.

3.1 Research Design

This study used the descriptive method which employed the quantitative research that involves data collection, analysis and interpretation of data and conclusion. It is mainly statistical analysis needed to solve the research problems. It was designed to identify the pre – service teachers' profile based on their age and gender. The respondent's characteristics namely: computer ownership, internet access, the length of computer exposure and the computer skills acquired.

3.2 Samples and Sampling Technique

This study utilized the convenient and purposive sampling technique. Convenient sampling because the respondent were the students of the one who conducted the study. Purposive because it was selected based on the characteristics of the respondents comprises solely taking up education and majoring in physical science.

3.3 Research Instruments

The study employed a researcher-made questionnaire patterned Technology Use Self – Competency Scale (TUSS). The questionnaire has three parts. The first part involved the gathering of the personal profile of the respondents which includes age, and gender. The second part referred to the pre – service teacher's characteristics such as computer ownership, internet access and length of computer exposure. The third part was used in obtaining factual

information. The respondents were to answer all the items in the questionnaire by labeling their preference on each item using the 4- point Likert-scale instrument ranging from (1) Poor (2) Fair (3) Good (4) Exceptional for the pre – service teachers' computer skills acquired.

3.4 Statistical Treatment

The researcher used the following statistical test to treat the data collected. The data is nominal. Descriptive statistics such frequency, percentage, weighted mean, standard deviation, and chi – square.

IV. RESULTS AND DISCUSSIONS

4.1 Demographic Profile of the Respondents (Age, Gender, Computer ownership, Internet access, Computer exposure)

Table 3

Demographic Profile of the Respondents As to Gender

Gender	F	%
Male	5	16.7
Female	25	83.3
Total	**30**	**100.0%**

It shows the distribution of the pre – service teachers as to gender. It shows that 5 or 16.7% of the respondents are males and the other 25 or 83.3% are females.

Table 4

Demographic Profile of the Respondents As to Age

Age	Male		Female		Total
	F	%	F	%	
23 above	1	20.0	0	0.0	1
21 – 22	1	20.0	6	24.0	7
19 – 20	3	60.0	19	26.0	22
Total	**5**		**25**		**30**

The table shows the distribution of the respondents as to age. The respondents vary in age ranging from 19 years old to 23 years above. Based from the data, the largest number of the pre – service teacher-respondent ranged from 19 – 20 years or 73.30%, followed by 21 – 22 years old with a frequency of 7 or 23.3% and least is the 23 years above with a frequency of 1 or 3.3%.

Table 5

Demographic Profile of the Respondents As to Computer Ownership

Computer Ownership	F	%
Yes	22	73.3
No	8	26.7
Total	**30**	**100.0%**

In terms of computer ownership by the pre – service teacher, the results showed that 22 or 73.3% owned a computer unit while 8 or 26.7 do not own a computer unit.

Table 6

Demographic Profile of the Respondents As to Internet Access

Internet Access	F	%
Yes	18	60.0
No	12	40.0
Total	**30**	**100.0%**

Presented in Table 6 is the distribution of pre – service teachers according to their internet access. The results showed that the highest percentage which is 60.00% for the 18 pre – service teachers, then 40.00% for the 12 pre - service teachers which do not have internet access.

Table 7

Demographic Profile of the Respondents As to Computer Exposure

Computer Exposure	F	%
Less Than 1 Year	5	16.7
1 – 2 Years	8	26.7
3 – 5 Years	10	33.3
More than 5 Years	7	23.3
Total	**30**	**100.0**

The data showed the computer exposure of the pre – service teachers, the highest is 3 – 5 years with a frequency of 10 or 33.30%, the second is 1 – 2years with a frequency of 8 or 26.70% and the third is more than 5 years with a frequency of 7 or 23.30% and the last is less than 1 year with a frequency of 5 or 16.70%.

4.2 What are the levels of computer skills acquired by pre – service in terms of:

4.1 Technology Use in Educational Environments (TUEE);

4.2 Basic Computer Skills (BCS); and,

4.3 Advanced Computer Skills (ACS)?

Table 8

Levels of Computer Skills Acquired By Pre-service As to Technology Use in Educational Environments

ITEM	n	Mean	Standard Deviation
42	30	3.20	0.610
28	30	3.13	0.629
40	30	3.13	0.571
37	30	3.07	0.640
38	30	3.07	0.640
39	30	3.03	0.556
29	30	3.03	0.556
19	30	3.03	0.718
36	30	2.97	0.669
34	30	2.97	0.669
6	30	2.93	0.740
43	30	2.90	0.803
13	30	2.90	0.607
33	30	2.90	0.548
35	30	2.87	0.571
20	30	2.87	0.629
16	30	2.77	0.728
27	30	2.77	0.626
25	30	2.77	0.679
22	30	2.73	0.740
21	30	2.70	0.750
10	30	2.60	0.770

The highest mean score is item no. 42 indicating that pre-service teachers were aware of using technology in their class in the future. However, the lowest mean score is item no. 10 indicating that pre-service teachers cannot easily evaluate the desired use of the technology.

Table 9

Levels of Computer Skills Acquired By Pre-service As to Basic Computer Skills

ITEM	N	Mean	Standard Deviation
15	29	3.55	.632
4	30	3.40	.675
12	30	3.30	.651
30	30	3.27	.691
41	30	3.20	.761
23	30	3.07	.785
32	30	2.90	.759
2	30	2.83	.950
5	30	2.80	.761
1	30	2.80	.714
3	30	2.60	.621

The highest mean score is in item no.15 indicating that pre-service teachers have a wide range of knowledge in basic computer skills like downloading from internet. However, the lowest mean score is in item no.3 indicating that the pre – service teacher solved independently when confronted problem on the computer.

Table 10

Levels of Computer Skills Acquired By Pre-service As to Advanced Computer Skills

ITEM	N	Mean	Standard Deviation
16	30	3.63	.556
18	30	2.87	.860
11	30	2.80	.805
14	30	2.80	.847
31	29	2.72	.797
17	30	2.63	.964
24	30	2.37	.490
7	30	2.30	.651
8	30	2.20	.551
9	30	2.10	.548

The highest mean score is in item no. 16 indicating that pre-service teachers were knowledgeable enough when in terms of uploading document or picture from the browser. However, the mean of the item no. 24, 7, 8, and 9 respectively have the lowest score stating that the respondents have difficulties on the technical aspect or manipulating the specific parts of the computer e.g working with desktop publishing program, solving common problem from the printer setting up the driver software of the computer and lastly, on the driver software that identifies hardware components to the computer.

4.3 Is there a significant relationship between the profile of the respondents and the level of their computer skills?

Table 11 Relationship of the computer skills acquired as to Computer Ownership

Variable	Chi – square Value	df	p - value	Decision
TUEE	21.307	21	0.440	Not Significant
BCS	16.193	15	0.369	Not Significant
ACS	20.635	13	0.081	Not Significant

The table shows the relationship between the computer skills acquired as to computer ownership by the respondents. In terms of technology use in educational environment, it obtained a chi – square value of 21.307 with the df value of 21 and with its p value of 0.440. However, with regards to basic computer skills it obtained a chi – square value of 16.193 with the df value of 15 and its p value is 0.369. Lastly, the respondents advanced computer skills obtained a chi – square value of 20.635, with a df value of 13 and its p value of 0.081. It was tested at 0.05 level of significance. Thus, it resulted at five percent level of significance, accepting the null hypothesis that there is no significant relationship between the level of skills acquired and computer ownership of the respondents.

Table 12

Relationship of the computer skills acquired as to Internet Access

Variable	Chi – square Value	df	p - value	Decision
TUEE	20.139	21	0.512	Not Significant
BCS	20.417	15	0.157	Not Significant
ACS	16.458	13	0.225	Not Significant

The table shows the relationship between the computer skills acquired as to internet access by the respondents tested. In terms of technology use in educational environment it obtained a chi – square value of 20.139 with the df value of 21 and with its p value of 0.512. However, with regards to basic computer skills it obtained a chi – square value of 20.417 with the df value of 15 and its p value is 0.157. Lastly, the respondents advanced computer skills obtained a chi – square value of 16.458, with a df value of 13 and its p value of 0.225. It was tested at 0.05 level of significant. Thus, it resulted at five percent level of significance, accepting the null hypothesis that there is no significant relationship between the level of skills acquired and internet access of the respondents.

Table 13 Relationship of the computer skills acquired as to Length of Computer Exposure

Variable	Chi – square Value	df	p - value	Decision
TUEE	64.296	63	0.431	Not Significant
BCS	49.725	45	0.291	Not Significant
ACS	42.045	39	0.340	Not Significant

The table shows the relationship between the computer skills acquired as to computer exposure by the respondents. In terms of technology use in educational environment it obtained a chi – square value of 64.296 with the df value of 63 and with its p value of 0.431. However, with regards to basic computer skills it obtained a chi – square value of 49.725 with the df value of 45 and its p value is 0.291. Lastly, the respondents advanced computer skills obtained a chi – square value of 42.045, with a df value of 39 and its p value of 0.340. It was tested at 0.05 level of significant. Thus, it resulted at five percent level of significance, accepting the null hypothesis that there is no significant relationship between the level of skills acquired and computer exposure of the respondents.

4.4 Based from the result, what ICT based program may be developed?

From the assessments done by the researchers based on the data driven from the study, the following ICT based training program is hereby proposed.

This ICT based training program may be implemented in the College of Education of Eulogio “Amang” Rodriguez Institute of Science and Technology to continuously equip the pre – service teachers in terms of technology use in the classroom. They can utilize the power of technology in terms of instruction as they are going to handle their own class in the future.

TRAINING DESIGN

Title: Information and Communication Technology (ICT) Based Training Program
Theme: *Information and Communication Technology: Meeting the Needs of the 21st Century Learners*
Participants: College of Education 3rd Year Students
Date: November 20, 2017
Venue: ICT Room, Nudas Hall

Rationale:

Numerous challenges exist for colleges of education to integrate technology into pre - service education programs, such as the implementation of standards for technology, designing pre service teacher education curriculum that integrates technology, increasing faculty and pre service teacher technology skill levels, and time constraints.

Teacher preparation institutions are focused on providing experiences for pre service teachers so they will learn to use technology and then meaningfully integrate those technologies into the learning process. However, despite state level initiatives to integrate technology for K-12 student learning, pre-service teachers are not well prepared for using technology in teacher preparation programs.

Pre - service teacher education students also take an advanced technology integration course during their junior year that focuses on the use of technology to support academic content. Technologies can provide powerful tools for student The importance of appropriate assessment tools plays a key role in the development of learner's higher-order thinking and 21st century skills.

Future educators therefore must be technologically equipped and skillful in the utilization of varied proven methods of effective classroom management techniques and doable strategies suited to the 21st century learners in order to achieve effective character formation inside the classroom.

It is with these thoughts that this seminar is conceptualized.

Objectives:

The seminar-workshop aims to:

1. develop an appreciation of the importance of technology in the teaching and learning process;
2. orient the pre – service teacher participants on the use of instructional technology in teaching and learning to meet the learners' 21st century needs;
3. equip them with interactive and enjoyable strategies and activities through computer technology to help develop the full potential of their learners; and
4. understand the importance of technology in student learning and development

Methodology: Training/ Seminar-Workshop

Committees:

Program & Certificates:	BSEd IV PhySci
Invitation and Reception:	BSEd III PhySci
Registration:	BSEd I PhySci
Foods:	BSEd II PhySci
Stage Preparation:	BSEd III PhySci
Documentation:	PS Students Org.
Evaluation:	BSEd III PhySci

Programme:

SEMINAR-WORKSHOP ON ICT BASED TRAINING PROGRAM

Theme: *Information Communication Technology: Meeting the Needs of the 21st Century Learners*
November 20, 2015
ICT Room, Nudas Hall

I. Opening Program

Prayer:	**MARILYN AMOGUIS** *BSEd III PhySci*
National Anthem	***BSEd I PhySci***
Opening Remarks	**RHANNY PEPITO** *BSEd III PhySci*
Inspirational Message	**DR. GLORIA T. MIANO** *Dean*
Intermission Number	**SELECTED PS STUD**
Statement of Purpose	**GRACELYN RIVAS** *BSEd IV PhySci*
Introduction of the Speaker	**JONALYN ATIENZA** *BSEd III PhySci*

II. Seminar Proper

- ✓ **WORKING WITH DESKTOP PUBLISHING PROGRAM**
  Prof. CHRISTOPHER ALVARO
- ✓ **COMMON PRBLEMS ENCOUNTERED IN USING PRINTER**
  Prof. LYDIA ERA
- ✓ **INSTALLING SYSTEM SOFTWARE IN PC and HARDWARE IDENTIFICATION**
  Prof. ANNA BUENASEDA

III. Closing Ceremonies and Giving of Certificates

Distribution of Certificates

Closing Remarks **MANILYN PALAYA**
BSEd IV PhySci

Masters of Ceremonies: PJ Gamil & Sarah Vidal

Registration Fee:
Php 50.00 (inclusive of snack, certificate, program and token for speakers)

Prepared by:

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of the study, the following **conclusions** were drawn.

1. The demographic profile of the teacher respondents in terms of:

a. Gender. Majority of the respondents are males than females.

b. Age. The respondents vary in age ranging from 19 years old to 23 years above.

c. Computer Ownership. Pre – service teacher respondents who owned computers have the largest in numbers, while those who do not owned a computer unit has the least in number.

d. Internet Access. Pre – service teacher respondents have internet access and the least among the pre – service teacher respondents do not have internet access.

e. The computer exposure of the pre – service teachers, is within 3 – 5 years, the second is within 1 – 2 years, the third is more than 5 years and the least is less than 1 year.

2. Levels of computer skills acquired by pre – service in terms of:

2.1 Technology Use in Educational Environments (TUEE). Based from the data on the levels acquired by the pre – service teachers in Technology Use in Educational Environment was good. They can perform or use technology independently.

2.2 Basic Computer Skills (BCS) The basic computer skills of the pre – service teacher are good in basic computer skills. They can do and perform basic computer skills by themselves.

2.3 Advanced Computer Skills (ACS) There are areas in advanced computer skills that obtained a mean score below 2.5. This indicated that a fair skill on that particular area in computer skills. The pre – service teachers cannot perform independently but need help from others.

3. There is no significant relationship between the levels of computer skills acquired by the respondents as to computer ownership, internet access and the length of computer exposure.

4. An ICT based training program was proposed by the researcher to equipped the pre – service teachers in terms of technological skills as they are going to handle their class in the future and they know how to utilized the power of technology in terms of instruction.

Recommendations

The following are the recommendations:

1. Should revisit their technology training in teacher education program.

2. Should support the technology training with more experiential, hands- on, authentic and constructivist activities. Especially, the technology courses, training program be connected between theoretical knowledge or skills learned through experiential technology courses and practical applications in student teaching and field based models be used for this.

3. Provide advance computing skills courses through preparation of computer based instructional materials.

4. Pre-service entry technology proficiency skills should be considered before starting their technology training. Technology training should shape based on these entry skills.

5. Employ technology support task force for both technical and instructional purposes.

6. Prepare on-going technology plan.

7. Replicate the study using different variables and in different setting.

REFERENCES

Abbitt, J. T. (2011). An investigation of the relationship between self-efficacy beliefs about technology integration and technological pedagogical content knowledge (TPACK) among preservice teachers. *Journal of Digital Learning in Teacher Education, 27*(4), 134-143. http://dx.doi.org/10.1080/21532974.2011.10784670

Baylor, A. L., and D. Ritchie. (2002) "What Factors Facilitate Teacher Skill, Teacher Morale, and Perceived Student Learning in Technology-using Classrooms?" *Computers and Education, 39*(4): 395–414. http://dx.doi.org/10.1016/S0360-1315(02)00075-1

Banister, S., & Vannatta, R. (2006). Beginning with a Baseline: Insuring Productive Technology Integration in Teacher Education. *Journal of Technology and Teacher Education, 14*(1), 209-235.

Beasley, W., & Wang, L. C. (2001). Implementing ISTE/NCATE technology standards in teacher preparation: One college's experience. *Information Technology in Childhood Education Annual 200,* (1), 33-44. [Online]. Available: http://dl.aace.org/6374

Bell South. (2001). The Growing Technology Gap Between Schools and Students: Findings from the BellSouth Foundation Power to Teach Program [Online]. Available: http://www.bellsouthfoundation.org/pdfs/pttreport03.pdf

Bransford, J., Brown, A., & Cocking, R. (Eds.). (1999). *How People Learn: Brain, Mind, Experience, and School.* Washington, DC: National Academy Press.

Cakir, R., & Yildirim, S. (2015). Who are They Really? A Review of the Characteristics of Pre-service ICT Teachers in Turkey. *The Asia-Pacific Education Researcher, 24*(1), 67-80. http://dx.doi.org/10.1007/s40299-013-0159-9

Carew, D. (2004). Educating the 21st century citizen. White paper. Retrieved August 1, 2005, Cetin-Berber, D., & Erdem, A. R. (2015). An Investigation of Turkish Pre-Service Teachers'Technological, Pedagogical and Content Knowledge. *Computers, 4*(3), 234 250.http://dx.doi.org/10.3390/computers4030234

Chai, C. S., Koh, J. H. L., & Tsai, C. C. (2010). Facilitating preservice teachers' development of technological, pedagogical, and content knowledge (TPACK). *Journal of Educational Technology & Society, 13*(4), 63-73.

Chai, C. S., Koh, J. H. L., Tsai, C. C., & Tan, L. L. W. (2011). Modeling primary school pre-service teachers' Technological Pedagogical Content Knowledge (TPACK) for meaningful learning with information and communication technology (ICT). *Computers & Education*, *57*(1), 1184-1193.

Chauve, P. (2003). A challenge for Europe's education systems. *Learning and Teaching in the Communication Society* (pp. 5 – 26). Strasbourg: Council of Europe.

Davis, N. (1997). Information technology in teacher education: Increased recognition and demand. *Journal of Information Technology for Teacher Education, 6(3),* 219 – 225.

Kynigos, C. (2003). Teacher training and the role of teachers in the communication society: Teacher training and the teacher profession. *Learning and Teaching in the Communication Society* (pp. 243 – 269). Strasbourg: Council of Europe.

Martinson, D. L. (1998). Educators and the new mass media technology: The good, the bad, and the ugly. *Contemporary Education 69(3),* 150 – 154.

Rowe, S. B. (1998). Utopia or a scary monster: A discussion on the effectiveness of computer technology. *Contemporary Education 69(3),* 144 – 149.

Wilkerson, T. L. (2000). Preparing teacher candidates for the integration and implementation of appropriate technology: A triad approach. . *Proceedings of Society for Information Technology and Teacher Education*, USA, 1380 – 1384.

Willis J. W. & Mehlinger H.D. (1996). Information Technology and Teacher Education. In Sikula J. (Ed.), *Handbook of Research on Teacher Education* (2nd ed., pp. 978-1029). New York: MacMillan Library Reference.

EFFECTIVENESS OF THE LEARNING MODULE FOR HISTORY OF ARCHITECTURE 4: AN ASSESSMENT

Georgyn Z. Jimenez
Rolan B. Alamillo

INTRODUCTION

History of Architecture subjects play a vital part in the curriculum of Bachelor of Science in Architecture. This is also one of the subjects included in the curriculum for the Board of Architecture, thus it is very important that a student learns and internalizes the contents of this subject. History of Architecture covers all the architectural reflections of thoughts all over the world, from the beginning of civilization up to the present time. This subject is divided into four parts and is offered on the second and third year level of the architecture curriculum.

Teaching History of Architecture post a great challenge to the faculty handling it. Since this subject is an important part of the architecture curriculum, and it is a common knowledge that students get easily bored in history subjects, how would the faculty or the instructor get the students' attention and focus on what he is teaching? Furthermore, in today's time, where there are so many problems in our country that sometimes resulted in suspension of classes, and added to that, the unpredictable weather conditions that also ends up in classes suspension, how can the teaching-learning process be facilitated? To add more burden to the students, learning materials for history of architecture, specifically for history of architecture 4, were very few and so expensive that one ordinary student cannot afford to own.

As one of the faculty in architecture handling the subject, the proponent collaborated with other architecture faculty members who had previously handled the same subject to develop a learning module in History of Architecture 4. The learning module was aimed to enhance and facilitate the teaching-learning process in this subject and to make the students participate through active learning. Further, the proponents wanted to help the students attain the objective of the subject in a more informative, attractive and enjoyable way without spending too much for books and even with the threat of classes' suspensions.

To make the learning module in History of Architecture 4 more useful and effective as a teaching tool, the proponents subjected the said module to assessment, thus this study was conducted.

This study was undertaken to assess the effectiveness of the developed module in terms of its; a.) objectives, b.) contents, c.) language and style, d.) usefulness, e.) application, and f.) evaluation activities.

Aside from the given guidelines on the development of self-instructional materials, the assessment was also anchored from the statements, and results of the studies of the following:

Macarandang stated in her paper, "*Evaluation of a Proposed Set of Modules in Principles and Methods of Teaching, 2009*" that as an instructional strategy, modules are designed to bring about a satisfactory level kind of learning among slow, average and fast learners.

Robles stated that self-instructional materials, a.) provides for individual learning because there is no need to wait until there are enough learners to form a group; b.) it is self-paced learning where each individual can work at his or her own pace rather than the pace of a group which may be too fast or too slow; c.) it can be learned privately so that there is no danger of "loss of face" as might be feared in certain kinds of group learning; d.) they are available at any time, at any place and to any number; e.) they provide standardized content so that all learners receive the same content; f.) materials can include contributions from national and international experts; g.) they have updatable content and can use structured teaching, active learning and frequent feedback; and h.) they have explicit aims and objectives.

The statement of Robles was strengthened by Robert by stating that self-instructional materials should follow certain guidelines such as: 1.) the module must be limited in scope to cover what is normally covered in one class period; 2.) materials should always contain a review of pre-requisite content; 3.) all items in the module should be simple and clearly defined; 4.) language should be simple and easily understood by its intended users; 5.) all that a teacher would normally discuss in class should be presented in detail in the material; and 6.) the material should be supplementary to other existing instructional materials.

Finally, Race emphasizes that the main principle underlying the use of self-instructional materials is to make learning reactive, interesting, successful and humane. And by all of these statements, the proponents subjected the developed learning module in History of Architecture 4 in an assessment, thus this study was conducted.

MATERIALS AND METHODS

The proponents utilized the descriptive method of assessing the effectiveness of the learning module in History of Architecture 4.

The learning module was assessed by seven (7) faculty members of architecture and thirty (30) third year architecture students enrolled in the subject under study who have used the learning modules. Both group of respondents were from the College of Architecture and Fine Arts of Eulogio "Amang" Rodriguez Institute of Science and technology. The main instrument used in this study was a questionnaire on the assessment of learning module containing the guidelines on the development of self-instructional material, with a scale of one to five, one being the lowest and five being the highest. The questionnaires were distributed to the group of respondents, collected, tabulated, analyzed, and were given a statistical treatment.

RESULTS AND DISCUSSION

a. Objectives

Table 1 shows the faculty and students' assessment of the specific objectives of each lesson in the module. As stated in the table, criteria no. 1 "*The objectives are clearly stated"* was ranked no. 1 with verbal interpretation of very acceptable. Ranked no. 2 was criteria no. 2 "*The objectives are related to the contents"* with verbal interpretation of very acceptable. Criteria no. 5 "*They provide direction to learners and to the learning content"* and criteria no. 4 "*They are specific, measurable, achievable, relevant and time bound"* was ranked no. 3 and no. 4 respectively both with verbal interpretation of very acceptable. Ranked last was criteria no. 3 "*They are expressed in language that is easy to understand"* with verbal interpretation of very acceptable.

Table 1

Faculty and Students' Assessment of the Specific Objectives of Each Lesson in the Module

CHARACTERISTICS	FA	R	VI	SA	R	VI	CWM	VI	OR
1. The objectives are clearly stated.	5	1	VA	4.44	2	VA	4.72	VA	1
2. The objectives are related to the contents.	4.86	2.5	VA	4.5	1	VA	4.68	VA	2
3. They are expressed in language that is easy to understand.	4.13	5	VA	4.41	3	VA	4.42	VA	5
4. They are specific, measurable, achievable, relevant and time bound.	4.71	4	VA	4.17	5	A	4.44	VA	4
5. They provide direction to learners and to the learning content.	4.86	2.5	VA	4.24	4	VA	4.55	VA	3
COMPOSITE MEAN	**4.77**		**VA**	**4.35**		**VA**	**4.56**	**VA**	

Legend:
FA – Faculty assessment
SA – Students' assessment
VI – Verbal interpretation
CWM – Combined weighted mean
VA – Very acceptable
A – Acceptable
R – Rank
OR – Overall rank

b. Contents

Table 2

Faculty and Students' Assessment of the Contents of the Module

CHARACTERISTICS	FA	R	VI	SA	R	VI	CWM	VI	OR
1. The subject matter supports the instructional objectives.	4.57	4	VA	4.2	2.5	VA	4.39	VA	3
2. Overview is provided.	4.86	1.5	VA	4.2	2.5	VA	4.53	VA	2
3. The subject matter is arranged in logical sequences.	4.43	7	VA	3.97	7	A	4.2	VA	7
4. The concepts for each activity are arranged logically that there is no duplication.	4.14	8	A	4.00	6	A	4.07	A	8
5. Time allotment is provided.	4.57	4	VA	3.96	8	A	4.27	VA	6
6. Illustrations are provided for the student to understand concept.	4.86	1.5	VA	4.27	1	VA	4.57	VA	1
7. Sufficient information are provided for the student to understand concept.	4.48	6	VA	4.16	4	A	4.32	VA	5
8. The concept prepares the student for practical application.	4.57	4	VA	4.10	5	A	4.34	VA	4
COMPOSITE MEAN	**4.55**		**VA**	**4.11**		**A**	**4.34**	**VA**	

Legend:
FA – Faculty assessment
SA – Students' assessment
VI – Verbal interpretation
CWM – Combined weighted mean
VA – Very acceptable
A – Acceptable
R – Rank
OR – Overall rank

Table 2 shows the respondents assessment on the contents of the module. Ranked first is criteria no. 6 "*Illustrations are provided for the student to understand concepts better"* with a combined weighted mean of 4.57 and a verbal interpretation of very acceptable. Criteria no. 2 "*Overview is provided"*, criteria no. 1 "*The subject matter supports the instructional objectives"*, criteria no. 8 "*The concept prepares the student for practical application"*, criteria no. 7 "*Sufficient information are provided for the student to understand concept"*, criteria no. 5 "*Time allotment is provided"*, and criteria no. 3 "*The subject matter is arranged in logical sequences"* were ranked nos. 2, 3, 4, 5, 6, and 7 respectively, all with verbal interpretation of very acceptable. Ranked last is criteria no. 4 "*The concepts for each activity are arranged logically that there is no duplication"* with a combined weighted mean of 4.07 and verbally interpreted as acceptable.

c. Language and Style

Table 3

Faculty and Students' Assessment of the Language and Style Used in the Module

CHARACTERISTICS	FA	R	VI	SA	R	VI	CWM	VI	OR
1. Language uses the learner's level of comprehension.	4.43	4.5	VA	4.3	3	VA	4.37	VA	4
2. The presentation is clear and simple.	4.43	4.5	VA	4.29	4	VA	4.36	VA	5
3. Terms convey messages of the subject matter/topic.	4.86	1	VA	4.10	5	A	4.48	VA	3
4. Provides clear understanding of basic concept/principles.	4.71	2.5	VA	4.34	2	VA	4.53	VA	2
5. The mechanics, structure and style or formats are appropriately designed.	4.71	2.5	VA	4.44	1	VA	4.58	VA	1
COMPOSITE MEAN	**4.63**		**VA**	**4.3**		**VA**	**4.46**	**VA**	

Legend:
FA – Faculty assessment
SA – Students' assessment
VI – Verbal interpretation
CWM – Combined weighted mean
VA – Very acceptable
A – Acceptable
R – Rank
OR – Overall rank

Table 3 shows the respondents assessment on the language and style used by the proponent in her developed module. As stated in the table, ranked first with a combined weighted mean of 4.58 and verbally interpreted as very acceptable is criteria no. 5 "*The mechanics, structure and style or formats are appropriately designed"*. Ranked second, third and fourth, all with verbal interpretation of very acceptable are criteria nos. 4 "*Provides clear understanding of basic concept/principles"*, 3 "*Terms convey messages of the subject matter/topic"*, 1 "*Language uses the learners level of comprehension"* respectively. Ranked last is criteria no. 2 "*The presentation is clear and simple"* with a combined weighted mean of 4.36 and a verbal interpretation of very acceptable.

d. Usefulness

Table 4
Faculty and Students' Assessment on the Usefulness of the Module

CHARACTERISTICS	FA	R	VI	SA	R	VI	CWM	VI	OR
1. Serves as motivation to student to be more creative and productive.	4.29	3	VA	4.37	1	VA	4.33	VA	3
2. It is responsive to the needs of the student in the world of work.	4	5	A	3.97	5	A	3.99	A	5
3. Develops interest and capabilities for continuous learning.	4.28	4	VA	4.04	4	A	4.16	A	4
4. Contribute to student development both theoretical and practical aspect.	4.57	1	VA	4.27	3	VA	4.42	VA	1
5. Provides enough information in the absence of textbooks.	4.43	2	VA	4.34	2	VA	4.39	VA	2
COMPOSITE MEAN	**4.31**		**VA**	**4.2**		**VA**	**4.26**	**VA**	

Legend:
FA – Faculty assessment
SA – Students' assessment
VI – Verbal interpretation
CWM – Combined weighted mean
VA – Very acceptable
A – Acceptable
R – Rank
OR – Overall rank

Table 4 shows the respondents assessment on the usefulness of the module in enhancing and facilitating teaching and learning process. Criteria no. 4 "*Contribute to student development both theoretical and practical aspect"* was ranked first with a combined weighted mean of 4.42 verbally interpreted as very acceptable. Ranked second with CWM of 4.39 and third with CWM of 4.33 both with verbal interpretation of very acceptable were criteria nos. 5 "*Provides enough information in the absence of textbooks" and 1 "Serves as motivation to student to be more creative and productive".* Criteria nos. 3 "*Develops interests and capabilities for continuous learning",* and 2 "*It is responsive to the needs of the student in the world of work"* were ranked fourth and fifth with CWM of 4.16 and 3.99 respectively both verbally interpreted as acceptable.

e. Application

Table 5
Faculty and Students' Assessment on the
Application of the Module in the Teaching – Learning Process

CHARACTERISTICS	FA	R	VI	SA	R	VI	CWM	VI	OR
1. Application of the lessons is sequential.	4.57	1.5	VA	4.27	3	VA	4.42	VA	3
2. The instructions are clear, logical and suitable.	4.43	3.5	VA	4.47	1	VA	4.45	VA	1
3. The illustrations are properly drawn and labeled.	4.57	1.5	VA	4.2	4	VA	4.39	VA	4
4. Procedure is clear and can be easily understood.	4.43	3.5	VA	4.43	2	VA	4.43	VA	2
COMPOSITE MEAN	**4.5**		**VA**	**4.34**		**VA**	**4.42**	**VA**	

Legend:
FA – Faculty assessment
SA – Students' assessment
VI – Verbal interpretation
CWM – Combined weighted mean
VA – Very acceptable
A – Acceptable
R – Rank
OR – Overall rank

Table 5 shows the respondents assessment on the application of the module in the teaching – learning process. As shown in the table, all the criteria were given a verbal interpretation of very acceptable with criteria no. 2 "*The instructions are clear, logical and suitable"* in the first rank. Ranked second is criteria no. 4 "*Procedure is clear and can be easily understood"*, third is criteria no. 1 "*Application of the lessons is sequential"* and ranked last is criteria no. 3 "*The illustrations are properly drawn and labeled".*

f. Evaluation Activities

Table 6
Faculty and Students' Assessment of the Evaluation Activities in the Module

CHARACTERISTICS	FA	R	VI	SA	R	VI	CWM	VI	OR
1. Evaluation of items are congruent with the learning objectives.	4	3	A	4.20	4	VA	4.1	A	4
2. Ensures the development skills in subject.	4	3	A	4.23	3	VA	4.12	A	3
3. Exercises are provided in every learning lessons.	4	3	A	4.33	1	VA	4.17	A	2
4. Minimum time allotment is provided.	4.15	1	A	4.27	2	VA	4.21	VA	1
COMPOSITE MEAN	**4.04**		**A**	**4.26**		**VA**	**4.15**	**A**	

Legend:
FA – Faculty assessment
SA – Students' assessment
VI – Verbal interpretation
CWM – Combined weighted mean
VA – Very acceptable
A – Acceptable
R – Rank
OR – Overall rank

Table 6 shows the respondents assessment of the evaluation activities in the module. As stated, ranked no. 1 with a combined weighted mean of 4.21 and verbally interpreted as very acceptable is criteria no. 4 "*Minimum time allotment is provided"*. Ranked second, third and fourth, all with verbal interpretation of acceptable were criteria nos. 3 "*Exercises are provided in every learning lessons"*, 2 "*Ensures the development skills in subject"* and 1 "*Evaluation of items are congruent with the learning objectives".*

CONCLUSIONS

From the data gathered and discussed, the following conclusions are derived:

1. The learning module collaboratively developed by the proponents for History of Architecture 4 was very acceptable for use in the subject and has followed the guidelines in developing self-instructional materials and therefore can be utilized as a teaching-learning tool in the said subject.

2. The specific objectives for each lesson were clearly stated, though the expression of the language is not easy to understand for the target users. With the given result, the authors can reconstruct the objectives and will try to use language that will be easily understood by the target users.

3. The contents of the modules reflect the most important aspects of the subject. Illustrations and overview for better understanding were provided. The learners can easily absorb and internalize the lessons presented because of the illustrations provided.

4. The language and style used were appropriately designed, but to the target users, the presentation was not clear and simple. The authors will review the presentation and try to make it fit for the target users.

5. The module was found to contribute to the development of the student both in theory and practical aspect. It is also useful in providing enough information in the absence of textbooks. However, the module is not responsive to the needs of the students in the world of work. To further improve the module and make it responsive and applicable in the world of work, the author will try to coordinate with the industry connected to architectural practice.

6. The instructions on the application of the lesson in the module were clear, logical and suitable. The students can easily understand the instructions on the module.

7. Exercises as basis for evaluation were provided for every learning lessons. However, the evaluation of items are not congruent with the learning objectives. Items for evaluation will be constructed or designed congruent to learning objectives.

RECOMMENDATIONS

Based on the conclusions generated from the findings, the following recommendations are herewith given:

1. The learning module be improved and enhanced by using simple language that can easily be understood by the users in stating objectives for each learning lessons, presentation of each lesson be made more simpler and clearer, and the items to be evaluated must be made congruent with the learning objectives. The module should also be designed in such a way that it can be made responsive to the needs of the student in the world of work.

2. After improving the instructional module, further validation should be done by utilizing them in the experimental and controlled groups.

3. Encourage other architecture faculty members to develop instructional materials not only for the lecture subjects but most especially for the major and board subjects and make it part of their teaching strategies.

BIBLIOGRAPHY

Macarandang, Mercedes A. EVALUATION OF A PROPOSED SET OF MODULES IN PRINCIPLES AND METHODS OF TEACHING, University of Batangas, 2009

Race, Phil. THE OPEN LEARNING HANDBOOK, Nichols Publishing, USA, 1989

Robles, Felicidad C. THE EVALUATION AND PREPARATION OF INSTRUCTIONAL MATERIALS: COMMITMENT TO PROFESSIONAL DEVELOPMENT, 1988

STUDENTS' DISCERNMENT OF ACADEMIC WORKLOAD AND ACADEMIC OUTCOMES IN ARCHITECTURAL EDUCATION IN EARIST, MANILA

Ar. Diane A. Jose
Ar. Fernando C. Pamintuan

I. INTRODUCTION

Architectural education has been heavily criticized. "Architectural pedagogy has become stale" (Colomina, 2012). Education, its underlying rituals and processes, has not really changed over the past years and this is one of its biggest weaknesses (Till, 2012a). Schools of architecture are struggling to keep up with the current issues that are transforming architecture practice, and students are not educated to meet the industry and wider market needs (RIBA, 2005).

Traditionally, architectural education has entailed a challenging regimen closely based on teachings developed at the Ecole des Beaux-Arts founded in 1793. The Ecole and its predecessor, the Academie d' Architecture founded in 1671, institutionalized architectural education and established the architect as an elite specialist. Today, the explicit or controlled lecture courses still communicate history, technology, and legal issues while the tacit or autonomous studio ennobles creative exploration, organization of complex problems, and synthetic propositions.

With this, one of the biggest criticisms of architectural education is the 'traditional' design studio as the typical paper-based studio projects found in most architecture schools. The traditional design studio is based on experimental learning and is a fundamental part of our education. In the RIBA's recent 2011 validation criteria, this stated that "broadly interpreted design represents the key intellectual and practical skill of an architect; therefore, at least 50% of all assessed work at Part 1 and at Part 2 is to be executed as design studio projects" (RIBA, 2011a). However, key themes often rose, when discussing the pitfalls of our education; include the lack of practical experience, collaboration and communication skills, and business experience. All of these are rarely dealt with in the design studio alone.

A typical design studio works on a brief frequently written by the design instructor. These more than often develop into "elaborated scenarios", based on private research and tailored to the student's personal objectives, having little relevance to reality (Buchanan, 2012a). There is often a focus on showcasing individual creativity and finding 'startling originality', rather than engaging with wider contemporary issues (Buchanan, 2012b). "What is left out of university education is the ordinary" (Ward, 1996). Projects that steer too close to the norm are often seen as mundane or not innovative enough.

The duality between studios and lectures can create disagreement and disengagement. Two competing agendas coupled with a high-pressure academic setting may very well put architecture students in an inherently conflicted situation. The mix of these pedagogical components is not at issue in the research, instead, only their combined impact on academic workload along with the corresponding educational results and psychological impacts are investigated.

One of the main elements of curriculum design is the student workload (Kember, 2004). Student workload can be interpreted (Kember, 2004) as the number of working hours, which could consist of attending lectures, seminars or tutorials (contact hours) plus independent and private study, preparation of projects, examinations, and so forth (EC, 2005b).

Each course, and by extension, each degree, usually has a certain number of credits, which implies student workload. In different countries a credit is associated with a different workload. In the CHED, the recent draft of B.S. Architecture program has decreased to a total of 218 credit units from 232 credit units in the CMO no. 61 series of 2006. The workload offers information on whether student efforts fit the time assigned to the course and may be subsequently readjusted.

Numerous studies point out that not all learners are the same and need different amounts of time for the same learning objectives. Finding an average student is certainly very difficult. But, in order to be operative, as Chambers notes (1994): "we do have to take the average learner as our yardstick rather than the extremely fast or slow learner"

To understand the impact of workload and time constraints on architectural education, a generic weekly schedule of third year undergraduate curriculum at Architecture Department of Eulogio "Amang" Rodriguez Institute of Science and Technology was developed. This 14-credit hour per semester model is based on conventional ratios (2 to 1) of study time relative to class meeting time.

This is important from a didactic point of view because an excessive workload interferes with adequate application of concepts and does not constitute 'good learning' (Chambers, 2004), promoting surface learning approaches. Overload is also related to absenteeism from lectures, lack of success (Cope & Staehr, 2005), and is one of the main causes of dropping out (Gallardo, 2011). It can have very harmful effects on the student, such as lack of self-esteem and confidence, anxiety and depression (Diaz, Glass, Arnkoff, & Tanofsky-Kraff, 2011) that may lead to learning difficulties (Bachman, 2006). In spite of this, work overload is usually a frequent element in subjects for which dedication time has not been measured.

Table 1. Schedule (in hours) for third year student's 40-credit hour for one (1) week, for 1st Semester

FIRST SEMESTER				
CODE	SUBJECT	lec.	stu	unit
ADE 315	Space Planning 2	1	9	4
ABT 313	Const. Drawing in Wood, Steel & Concrete (2-storey)	2	3	3
ABU 312	Electrical & Mechanical Systems	3	0	3
AHT 313	History of Architecture 3	3	0	3
AES 312	Strength of Materials	3	0	3
APP 311	Laws Affecting the Practice of Architecture	3	0	3
LIT 211	Introduction to Literary Types	3	0	3
CADD 1	Computer-Aided Design & Drafting 1	1	9	3
	TOTAL UNITS	19	21	25
	TOTAL CONTACT UNITS/HOURS PER WEEK	40 hours		
	TOTAL CONTACT UNITS/HOURS PER SEMESTER	720 hours		

Table 2. Time distribution (in hours) for third year student's 40-credit hour for one (1) week, for 1st Semester

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
7:00 AM - 8:00 AM						
8:00 AM - 9:00 AM						
9:00 AM - 10:00 AM						
10:00 AM - 11:00 AM	APP 311 M. Florendo					
11:00 AM - 12:00 NN	308-A					
12:00 NN - 1:00 PM		FIL 103		FIL 103		
	AES 312	F. Castro	AES 312	F. Castro		
1:00 PM - 2:00 PM	E. Pamintuan	310	E. Pamintuan	310		
	312		312			LIT SP 103
2:00 PM - 3:00 PM						Unassigned
	AHT 313		AHT 313			311
3:00 PM - 4:00 PM	G. Jimenez		G. Jimenez			
	310		310			
4:00 PM - 5:00 PM				ABT 313a		
		CADD 1		J. Cruz		ABU 312
5:00 PM - 6:00 PM		E.R. Enguero		308-A		D. J. Gozar
	ADE 315	307	ADE 315			309
6:00 PM - 7:00 PM	D. J. Gozar		D. J. Gozar			
	310		310			
7:00 PM - 8:00 PM						
8:00 PM - 9:00 PM						
TOTAL	11 Hours	7 Hours	11 Hours	5 Hours		6 Hours

Table 3. Weekly plan (in hours) for the student's 40-credit hour for 1st semester

	MON	TUE	WED	THU	FRI	SAT	SUN	WEEK
School	12.0	11.0	12.0	11.0	0.0	8.0	0.0	54
Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Sleep	5.0	5.0	5.0	5.0	8.0	7.0	8.0	43
Eat	2.0	2.0	2.0	2.0	2.0	2.0	2.0	14
Personal	1.0	2.0	1.0	2.0	12.0	2.0	12.0	32
Household	1.0	1.0	1.0	1.0	2.0	2.0	2.0	10
Commute	3.0	3.0	3.0	3.0	0.0	3.0	0.0	15
Total	**24.0**	**24.0**	**24.0**	**24.0**	**24.0**	**24.0**	**24.0**	**168.0**

II. METHODOLOGY

The sample consisted of 113 architecture students who voluntarily participated in a cross-sectional survey designed to evaluate the effects of workload and performance. Participants were at least 18 years old and included both males and females. Of the total participants, 57% were males, 98 were between 18 and 20 years of age, 5 were younger than 18 years old, and 10 participants were over 23 years. Approximately 73% of the participants reported living with parents, 10% with other family, 12% with a roommate, 2% with a spouse, and 3% lived alone. They also reported being 82% single, 16% with a significant other, and 5% married.

Participants indicated their gender, age, marital status and residential address. Several questions addressed workload, stress, and learning experience that were specific to class categories reviewed in this study, namely: perception of academic stress - to assess participants' perceived stress with regard to academic performance and academic workload; social support - to examine perceived social support from friends and family; students' sleeping patterns as well as the number of hours they slept during weekdays and weekends; students' experiences as architecture students - for instance, students were asked to rate their "satisfaction with the learning experience in the Architecture Department"; anxiety; depression; motivation; and self-efficacy.

III. RESULTS AND DISCUSSION

Means and T-tests were calculated for all main variables included in this study and are represented in Table 4. T-tests examined differences between males and females and revealed significant differences for anxiety ($p < 0.05$), motivation because of fear of failure 0) < 0.05), and motivation to avoid failure ($p < 0.01$). Females' ratings were more likely to be higher on anxiety and motivation items relative to males.

Table 4. Means and T-Test significance between males (M) and females (F)

VARIABLES	GENDER	MEAN	T-TEST
Stress Factors			
Stress due to workload	M	4.37	
	F	4.59	
Sleep per weekday night	M	3.37	
	F	3.27	
Average sleep	M	3.08	
	F	2.87	
Nights withour sleep per month	M	3.71	
	F	3.88	
Psychosocial Factors			
Perception of Stress	M	4.88	
	F	5.06	
Satisfaction with program curriculum	M	3.72	
	F	3.61	
Motivation due to fear of failure	M	3.45	
	F	3.77	0.05
Motivation to avoid failure	M	3.60	
	F	3.90	0.01
Anxiety	M	1.86	
	F	2.10	0.05
Depression	M	2.35	
	F	2.51	
Social Support	M	3.64	
	F	3.85	
Self-Efficacy	M	3.33	
	F	3.22	

Table 5. Correlations for the main variables included in this study

	Perceived Stress	Sleep	Satisfaction	Motivation	Anxiety	Depression	Social Support	Self-Efficacy
Perceived Stress	1.00							
Sleep	0.30	1.00	0.07		-0.27	-0.31		0.26
Satisfaction	-0.10		1.00		0.24	-0.32		0.31
Motivation	0.36	-0.16	-0.10	1.00		0.31	-0.09	-0.12
Anxiety	0.29				1.00			-0.28
Depression	0.30				0.66	1.00		-0.42
Social Support	-0.14	0.10	0.30		-0.34	-0.44	1.00	0.32
Self-Efficacy	-0.22				0.30			1.00
Note: correlation is significant at the 0.01 level								

All correlations in this study were in expected directions, except for motivation and self-efficacy. As expected, perceived stress was negatively correlated with self-efficacy but positively correlated with anxiety, depression, and surprisingly, motivation. Greater self-efficacy was negatively correlated with anxiety and depression but positively correlated with satisfaction, sleep, and social support. There was a high positive correlation between anxiety and depression, a significant correlation between anxiety and satisfaction, and a negative correlation between anxiety, sleep, and social support. Depression was negatively and significantly correlated with satisfaction, sleep, and social support. As expected, the correlation between social support and satisfaction was significant. Finally, there was a significant correlation between sleep and motivation.

The goal of this study was based on the researchers' experiences as architecture faculty members with the hectic schedules of architecture students. The present results have important implications for architectural education, academic performance, and the roles of satisfaction, anxiety, and depression in the lives of architecture students.

A finding revealed that time dedicated to studio work is associated with anxiety, depression, and motivation. Thus, results only partially supported the relation between academic credit hours and time constraints. This study did not fully appreciate the strong impact of studio time on time constraints, as believed that technology and history classes would equally load on the factors associated with school stress. Time spent in studio was perceived as a constraint, which was then positively associated with stress. As expected, greater time constraint was negatively associated with performance.

This study relates to the strong association of self-efficacy with performance. Consistent with past research, findings support the negative relation between self-efficacy and social support with stress. Past studies showed individuals who believe they have the ability to be successful will be less likely to feel anxious, experience less depression, and may be more productive. In this study, findings show that greater self-efficacy is negatively related to stress. That is, the more self-efficacious students are less likely to experience stress.

Another implication in this study concerns social support for architecture students. It appears that the underlying effects of social support are important to architecture students' satisfaction but not their performance. The more social support architecture students received, the less likely they were to be depressed.

Findings also indicated a significant difference between males and females in satisfaction, anxiety, and fear of failure. Females did not feel as satisfied as males and were more anxious and fearful of failure. It is apparent that more research is needed to investigate gender differences in obtaining social support, especially with regard to architecture students.

Finally, research findings show that participants were driven by fear. It seems that greater anxiety is positively related to performance out of fear and students were anxious and depressed, such that they were driven to study primarily because they wanted to avoid failure rather than for the reward of learning.

IV. CONCLUSION AND RECOMMENDATIONS

The more stress associated with time constraints will increase perceptions of being overwhelmed and thus lead to increased anxiety and depression. Yet, an interesting question emerged with regard to self-efficacy and social support. Perhaps emphasizing experiences in which students could develop a greater sense of competence and less stress would be beneficial that as they acquire skills and beliefs about their abilities, their knowledge base can be used to interpret new information and create expectations. It would be interesting to focus on how such a knowledge base could be used in developing a course curriculum that encourages students to develop a greater sense of competence.

The long-term consequences of architectural education, can include serious health effects such as premature aging and immune system damage from prolonged sleep loss and other bad health habits.

Students who have learned autonomous motivation before entering college are more likely to succeed than those who rely on directed learning experiences (Brooks, 2011). If students who come most advantaged to cope with challenges are continually promoted at the expense of those who could have learned well in a properly managed environment, then architectural education has failed in the worst and most unjust of ways. Rather than educate at all, it would be working by a simple and gross process of elimination. Colleges should most properly judge themselves not so much by whom they start with or what their graduates achieve, but by how significantly they make a positive difference between their beginning and ending points.

Finally, workload management is not solely the responsibility of the educational institution. An equal share of academic workload planning belongs to the architecture student. Students must be encouraged to take charge of their own education rather than wait passively for it to happen to them according to some uniform and generalized degree plan. Some adjustments have to be anticipated and a great deal of autonomous motivation must be acquired to make the transition. In parallel thought, there is some sentiment that this generation's most elite students have decided that hard work and a full schedule constitute entitlement to a successful career and prosperous lifestyle. That whatever program the educational institution proposes, the actual course of action and responsibility for management is ultimately up to the student.

In psychological terms, academic workload is directly related to student motivation, feelings of mastery, self-determination, and self-efficacy (Church, et al., 2011; Harackiewicz, et al., 2012). It is characteristic of productive activity to convert meaningless labour to meaningful work and meaningful work into something approaching play. Excessive workload, however, defeats this tendency and promotes superficial effort.

REFERENCES

Bachman, L., & Bachman, C. (2006). Student perceptions of academic workload in Architectural education. Journal of Architectural and Planning Research, 23(4), 271e304.

Brooks D (2011) The organization kid. The Atlantic Monthly 287(4):40-54.

Buchanan, P. (2012a). 1989 July: What's wrong with architectural education? Almost everything. The Architectural Review, (31 October 2012), [Online] Available at: http://www.architectural review.com/ (Accessed 30th December 2012)

Buchanan, P. (2012b). The Big Rethink: Rethinking Architectural Education. The Architectural Review: The Education Issue, (28 September 2012), [Online] Available at: http://www.architectural review.com/ (Accessed 29th December 2012)

Chambers, E. (1994). Assessing learner workload. In F. Lockwood (Ed.), Materials production in open and distance learning (pp. 103e111). London: Paul Chapman Publishing.

Church MA, Elliot AJ, Gable SL (2011) Perceptions of classroom environment, achievement goals, and achievement outcomes. Journal of Educational Psychology 93(7):43-54.

Colomina, B (2012). Radical Pedagogies in Architectural Education. The Architectural Review: The Education Issue, (28 September 2012), [Online] Available at: http://www.architectural-review. com/ (Accessed 29th December 2012)

Cope, C., & Staehr, L. (2005). Improving students' learning approaches through intervention in an information systems learning environment. Studies in Higher Education, 30(2), 181e197.

Diaz, R. J., Glass, C. R., Arnkoff, D. B., & Tanofsky-Kraff, M. (2011). Cognition, anxiety, and prediction of performance in 1st-year law students. Journal of Educational Psychology,93(2), 420e429.

EC (European Commission). (2005a). From Berlin to Bergen. General progress report 7 April 2005/rev1. Brussels: A2/PVDH. Retrieved December 20, 2005, from http://europe.eu.int/comm/education/policies/educ/bologna/report05.pdf.

Harackiewicz JM, et al. (2012) Revision of achievement goal theory: Necessary and illuminating. Journal of Educational Psychology 94(3):638-645.

Kember, D. (2004). Interpreting student workload and the factors which shape students' perceptions of their workload. Studies in Higher Education, 29(2), 165e184.

RIBA (2005). Constructive Change: A strategic industry study into the future of the Architects' Profession. Summary. (December 2005) [Online] Available at: www.architecture.com (Accessed 29th December 2012).

RIBA (2011a). RIBA procedures for validation and validation criteria for UK and international courses and examinations in architecture. RIBA Education Department. (25th July 2011). [Online] Available at: www.architecture.com (Accessed 15th April 2012).

Till, J. (2012b). How will architects be educated in 20 years time. The Future of Architectural Education. Building Futures Think Series. March 2012.

Ward, C. (1996). Talking To Architects: Ten Lectures by Colin Ward. London: Freedom Press.

THINKY BUDDY: A MIND AND VISUAL TRAINING ANDROID GAME

Rowee M. Marfil
Dr. Nancy G. Liwanag

INTRODUCTION

Through the different innovation made by human and in today's world of modern technologies, people find easy ways to have amusement were just one click from their electronic gadget. Through the discovery and enormous accessibility of various of game application. Everyday opt to adopt on these changes and it greatly influence their lives specially the children. This study is created to solved the problem of some people within this world of modern technologies. One of the focus of the study is to divert the attention of the millennials on addictive games with violent subject matter. Researches will utilize mind and visual training games to minimize the numbers if those who were fond of adverse game. This study also eye on deviating people's attention especially the children on useful or educational games, that will help them make better choices and become useful citizen of the country.

This study will test and develop the critical thinking skills of the players in terms of how fast their minds to make necessary and immediate decisions. I t is a calculating or making notable judgment even outside school premises. It also develops the mental awareness while giving entertainment not only for the public but also for the members of the family.

MATERIALS AND METHODS

The main purpose of the study was to develop an android application entitled "THINKY BUDDY: A Mind and Visual Training Android Game."

Specifically, it sought to answer the following sub-problems:

1. What is the profile of the IT experts, ICT students, and end-users in term of?
    - 1.1 Sex;
    - 1.2 Age; and
    - 1.3 Literacy in Computer?
2. What is the assessment of the 3 groups of respondents on the developed system in terms of:
    - 2.1 Effectiveness;
    - 2.2 Efficiency:
    - 2.3 User Interface Design;
    - 2.4 Flexibility;
    - 2.5 Accuracy; and
    - 2.6 Availability of Help Menus?

3. Is there significant difference on the assessment of the 3 groups of respondents on the above mentioned variables?

4. Based on the findings, what implementation plan may be proposed?

The researchers chose Descriptive-Developmental Design. Developmental research, as opposed to simple instructional development, The researchers used Quota Sampling Purposive Sampling for IT Experts, the researchers used from each of these sections for they are obliged to answer the evaluation. The sample size will be chosen proportionally regardless of their gender.

Evaluation Form consisted of Profile of Evaluator where the respondents indicated information including name, age, gender, profession, computer literacy and, a questionnaire table about how the respondents see and rate the study according to its performance effectiveness, performance efficiency, user design interface, flexibility, security, help options and accuracy.

RESULT AND DISCUSSION

Criteria	End-User	IT	Students	Sub Mean	Adjectival Meaning	Rank
Performance Effectiveness	4.25	3.57	3.75	3.86	Very Acceptable	3
Performance Efficiency	4.28	2.67	3.8	3.58	Very Acceptable	5
User Interface Design	4.57	3.42	3.74	3.91	Very Acceptable	2
Flexiblity	4.32	3.64	3.82	3.96	Very Acceptable	1
Accuracy	4.35	3.17	3.81	3.78	Very Acceptable	4
Availability of help Menus	3.9	3.33	3.62	3.46	Very Acceptable	6
Grand Mean	**4.28**	**3.3**	**3.16**	**3.58**	**Very Acceptable**	

It can be gleaned from the Table 23 the Evaluation of the Student, End- User and IT Experts based of the presented criteria. The highest Sub-mean given by the evaluators is (Mean = 3.96) for the “Flexibility” which is “Very Acceptable”. The lowest is (Mean = 3.46) which is “Very Acceptable”. The overall rating is (Mean = 3.58) which is “Very Acceptable”.

CONCLUSION

Based on the results, the evaluation for the third and fourth year BSCS and BSCT students from ECC in the proposed system is VERY ACCEPTABLE.

It can be gleaned that the result of the evaluation in the sample end-user students of San Gabriel II Elementary School for the proposed system is Highly Acceptable.

Based on the evaluation, results from the IT expert for the proposed system is VERY Acceptable.

REFERENCES

Valchi. J. S., Geroge ect. Essesntials of System Analysis and Design Fifth Edition (2012)

Cabriera etal.,(2013) Fun Larning System(Unpublished Thesis) ECC

Orgesvick et al., (2015) Mind Lab: An Edutainment Android game (Unpublished Thesis) ECC.

ON CONSTRUCTION OF CAYLEY-SUDOKU TABLE

Rodora T. Oliveros
Rolita E. Belga, John Joshua DG. Padre Juan, and Rizza P. Pascua

INTRODUCTION

The game in its current form was invented by American Howard Garns in 1979 and published by Dell Magazines as "Numbers in Place." In 1984, Maki Kaji of Japan published it in the magazine of his puzzle company Nikoli. He gave the game its modern name of Sudoku, *Su-ji wa dokushin ni kagiru* which means "the numbers must be single".

The puzzle became popular in Japan and was discovered there by New Zealander Wayne Gould, who then wrote a computer program that would generate Sudokus.

One proves in introductory group theory that every element of any group appears exactly once in each row and once in each column of the group's operation or Cayley Table. (In other words, any Cayley Table is a Latin square.) Thus, every Cayley Table has two-thirds of the properties of a Sudoku Table; only the subdivision of the table into blocks that contain each element exactly once is in doubt. Cayley-Sudoku Tables can be made from any Cayley Table of any group by simply defining the blocks to be the individual rows (or columns) of the table.

This topic is interesting because the Cayley-Sudoku Table that was discussed can amaze the mind of the reader because it tackled some topics in Abstract Algebra which can create or develop a Sudoku puzzle.

STATEMENT OF THE PROBLEM/OBJECTIVES

This study investigated the properties and relations of Perfect Totient Numbers. Specifically, it sought to determine the following:

1. Definition of Cayley Sudoku Puzzle
2. Enumeration of different construction of Cayley Sudoku Puzzle
3. Definition of Magic Cayley-Sudoku Table

SIGNIFICANCE OF THE STUDY

The researchers believed that after seeking this paper, students will gain some information about Abstract Algebra and its application to surroundings and in other sort of things. The teachers will have knowledge about how Cayley Tables can be applied to Sudoku puzzle by using some theorems in Abstract Algebra literally in group theory.

For the future researchers, they will know how to apply some topics in mathematics and they will know some theorems that can be applied in a popular game such like Sudoku. They will also notice that Sudoku can be expanded using mathematics.

MATERIALS AND METHODS

The method that was used in this research is descriptive research but expository in nature.

Descriptive method of research is to describe the characteristics of the phenomenon being studied. It does not answer questions about how/when/why the characteristics occurred, rather it addresses the "what" questions. This is the best method to use since this study aim to describe the subject of the study. This research is also expository in nature because it described, explained, and informed. Every definition has a corresponding example and each theorem were accompanied by illustrations. Moreover, the study was not a survey type of research; hence, no respondents, no statistical treatment of data and no table of result were presented.

RESULTS AND DISCUSIONS

1. Construction of Cayley-Sudoku Table

Construction 1.1. Let G be a finite group. Assume H is a subgroup of G having order k and index n (so that $|G| = nk$). If $Hg_1, Hg_2, \ldots, Hg_n$ are the n distinct right cosets of H in G, then arranging the Cayley Table of G with columns labeled by the cosets $Hg_1, Hg_2, \ldots, Hg_n$ and the rows labeled by sets $T_1, T_2, \ldots, T_k$ (as shown in Figure 11) yields a Cayley-Sudoku Table of G with blocks of dimension n × k if and only if $T_1, T_2, \ldots, T_k$ partition G into complete sets of left coset representatives of H in G.

	Hg_1	Hg_2	…	Hg_n
T_1				
T_2				
⋮				
T_k				

Figure 1. A nxk Cayley-Sudoku Table

Furthermore, if $y_1H, y_2H, \ldots, y_nH$ are the n distinct left cosets of H in G, then arranging the Cayley Table of G with rows labeled by the cosets $y_1H, y_2H, \ldots, y_nH$ and the columns labeled by sets $R_1, R_2, \ldots, R_k$ yields a Cayley-Sudoku Table of G with blocks of dimension k × n if and only if $R_1, R_2, \ldots, R_k$ partition G into complete sets of right coset representatives of H in G.

Note: The given must be a finite group and it is not important if it is an abelian group or not.

Example 1.

$\mathbb{Z}_9$ can be broken up into 3 right cosets. The elements of $\mathbb{Z}_9 = \{0, 1, 2, 3, 4, 5, 6, 7, 8\}$ since in a Sudoku square problem it has 1, 2, 3, 4, 5, 6, 7, 8, and 9, we assume that 0 = 9.

$< 3 > +_9 0 := \{9, 3, 6\}$
$< 3 > +_9 1 := \{1, 4, 7\}$ and
$< 3 > +_9 2 := \{2, 5, 8\}$

	9	3	6	1	4	7	2	5	8
9									
1									
2									
3									
4									

5			
6 7 8			

Figure 2. A Cayley-Sudoku Table under $\mathbb{Z}_9$ having Three Cosets (Red, Blue, Green)

The columns in each block of the Cayley-Sudoku Table are labeled with elements of the right cosets of a subgroup.

The rows in each block of the Cayley-Sudoku Table are each labeled with a complete set of left coset representatives, that is, a left transversal.

	9 3 6	1 4 7	2 5 8
9 1 2			
3 4 5			
6 7 8			

Figure 3. A Cayley-Sudoku Table showing its Left Transversal under $\mathbb{Z}_9$

This is how to solve the elements for each block of Cayley-Sudoku Table of $\mathbb{Z}_9$.

Column Red: The elements of each block of {9, 3, 6}

To fill out the entries for the first block, consider the following solution:

$9 +_9 \{9, 3, 6\} = \{9 +_9 9, 9 +_9 3, 9 +_9 6\} = \{9, 3, 6\}$
$1 +_9 \{9, 3, 6\} = \{1 +_9 9, 1 +_9 3, 1 +_9 6\} = \{1, 4, 7\}$
$2 +_9 \{9, 3, 6\} = \{2 +_9 9, 2 +_9 3, 2 +_9 6\} = \{2, 5, 8\}$

	9	3	6	1	4	7	2	5	8
9	9	3	6						
1	1	4	7						
2	2	5	8						
3									
4									
5									
6									
7									
8									

$3 +_9 \{9, 3, 6\} = \{3 +_9 9, 3 +_9 3, 3 +_9 6\} = \{3, 6, 9\}$
$4 +_9 \{9, 3, 6\} = \{4 +_9 9, 4 +_9 3, 4 +_9 6\} = \{4, 7, 1\}$
$5 +_9 \{9, 3, 6\} = \{5 +_9 9, 5 +_9 3, 5 +_9 6\} = \{5, 8, 2\}$

	9	3	6	1	4	7	2	5	8
9	9	3	6						
1	1	4	7						
2	2	5	8						
3	3	6	9						
4	4	7	1						
5	5	8	2						
6									
7									
8									

$6 +_9 \{9, 3, 6\} = \{6 +_9 9, 6 +_9 3, 6 +_9 6\} = \{6, 9, 3\}$
$7 +_9 \{9, 3, 6\} = \{7 +_9 9, 7 +_9 3, 7 +_9 6\} = \{7, 1, 4\}$
$8 +_9 \{9, 3, 6\} = \{8 +_9 9, 8 +_9 3, 8 +_9 6\} = \{8, 2, 5\}$

	9	3	6	1	4	7	2	5	8
9	9	3	6						
1	1	4	7						
2	2	5	8						
3	3	6	9						
4	4	7	1						
5	5	8	2						
6	6	9	3						
7	7	1	4						
8	8	2	5						

Column Blue: The elements of each block of {1, 4, 7}

Solving all the entries in this column as shown below:

$9 +_9 \{1, 4, 7\} = \{9 +_9 1, 9 +_9 4, 9 +_9 7\} = \{1, 4, 7\}$
$1 +_9 \{1, 4, 7\} = \{1 +_9 1, 1 +_9 4, 1 +_9 7\} = \{2, 5, 8\}$
$2 +_9 \{1, 4, 7\} = \{2 +_9 1, 2 +_9 4, 2 +_9 7\} = \{3, 6, 9\}$
$3 +_9 \{1, 4, 7\} = \{3 +_9 1, 3 +_9 4, 3 +_9 7\} = \{4, 7, 1\}$
$4 +_9 \{1, 4, 7\} = \{4 +_9 1, 4 +_9 4, 4 +_9 7\} = \{5, 8, 2\}$
$5 +_9 \{1, 4, 7\} = \{5 +_9 1, 5 +_9 4, 5 +_9 7\} = \{6, 9, 3\}$
$6 +_9 \{1, 4, 7\} = \{6 +_9 1, 6 +_9 4, 6 +_9 7\} = \{7, 1, 4\}$
$7 +_9 \{1, 4, 7\} = \{7 +_9 1, 7 +_9 4, 7 +_9 7\} = \{8, 2, 5\}$
$8 +_9 \{1, 4, 7\} = \{8 +_9 1, 8 +_9 4, 8 +_9 7\} = \{9, 3, 6\}$

	9	3	6	1	4	7	2	5	8
9	9	3	6	1	4	7			
1	1	4	7	2	5	8			
2	2	5	8	3	6	9			
3	3	6	9	4	7	1			
4	4	7	1	5	8	2			
5	5	8	2	6	9	3			
6	6	9	3	7	1	4			
7	7	1	4	8	2	5			
8	8	2	5	9	3	6			

Column Green: The elements of each block of {2, 5, 8}

Solving all the entries in this column as shown below:

$$9 +_9 \{2, 5, 8\} = \{9 +_9 2, 9 +_9 5, 9 +_9 8\} = \{2, 5, 8\}$$

$$1 +_9 \{2, 5, 8\} = \{1 +_9 2, 1 +_9 5, 1 +_9 8\} = \{3, 6, 9\}$$
$$2 +_9 \{2, 5, 8\} = \{2 +_9 2, 2 +_9 5, 2 +_9 8\} = \{4, 7, 1\}$$
$$3 +_9 \{2, 5, 8\} = \{3 +_9 2, 3 +_9 5, 3 +_9 8\} = \{5, 8, 2\}$$
$$4 +_9 \{2, 5, 8\} = \{4 +_9 2, 4 +_9 5, 4 +_9 8\} = \{6, 9, 3\}$$
$$5 +_9 \{2, 5, 8\} = \{5 +_9 2, 5 +_9 5, 5 +_9 8\} = \{7, 1, 4\}$$
$$6 +_9 \{2, 5, 8\} = \{6 +_9 2, 6 +_9 5, 6 +_9 8\} = \{8, 2, 5\}$$
$$7 +_9 \{2, 5, 8\} = \{7 +_9 2, 7 +_9 5, 7 +_9 8\} = \{9, 3, 6\}$$
$$8 +_9 \{2, 5, 8\} = \{8 +_9 2, 8 +_9 5, 8 +_9 8\} = \{1, 4, 7\}$$

	9	3	6	1	4	7	2	5	8
9	9	3	6	1	4	7	2	5	8
1	1	4	7	2	5	8	3	6	9
2	2	5	8	3	6	9	4	7	1
3	3	6	9	4	7	1	5	8	2
4	4	7	1	5	8	2	6	9	3
5	5	8	2	6	9	3	7	1	4
6	6	9	3	7	1	4	8	2	5
7	7	1	4	8	2	5	9	3	6
8	8	2	5	9	3	6	1	4	7

Construction 1.2. Assume H is a subgroup of G having order k and index n. Also, suppose $t_1H, t_2H, \ldots, t_nH$ are the distinct left cosets of H in G. Arranging the Cayley Table of G with columns labeled by the cosets $t_1H, t_2H, \ldots, t_nH$ and the rows labeled by sets $L_1, L_2, \ldots L_k$ yields a Cayley-Sudoku table of G with blocks of dimension n × k if and only if $L_1, L_2, \ldots, L_k$ are complete sets of left coset representatives of H^g for all $g \in G$.

	t_1H	t_2H	...	t_nH
L_1				
L_2				
⋮				
L_k				

Figure 19. Construction 1.2 using the Left Cosets

Note: Suppose the finite group G contains subgroups $T := \{t_1, t_2, \ldots, t_n\}$ and $H := (h_1, h_2, \ldots, h_n\}$ such that $G = \{th : t \in T, h \in H\} := TH$ and $T \cap H = \{e\}$, then the elements of T form a complete set of left coset representatives of H and the cosets $Th_1, Th_2, \ldots, Th_k$ decompose G into complete set of left coset representatives of H^g for every $g \in G$.

Example 2.

Let $\mathbb{Z}_6$ be a finite group with the elements {0, 1, 2, 3, 4, 5} and assume that 0 = 6 for Sudoku purposes.

The subgroups of $\mathbb{Z}_6$ are;

$$T = < 2 > := \{6, 2, 4\} \text{ and}$$
$$H = < 3 > := \{6, 3\}$$

the number of column for Cayley-Sudoku Table is $T = \langle 2 \rangle^3 = 3$ and the number of row for Cayley-Sudoku Table is $H = \langle 3 \rangle^2 = 2$.

The elements of rows are;

$$\langle 3 \rangle +_6 \langle 2 \rangle := \{6 +_6 6, 6 +_6 2, 6 +_6 4\} = \{6, 2, 4\}$$
$$\langle 3 \rangle +_6 \langle 2 \rangle := \{3 +_6 6, 3 +_6 2, 3 +_6 4\} = \{3, 5, 1\}$$

The elements of column are;

$$\langle 2 \rangle +_6 \langle 3 \rangle := \{6 +_6 6, 6 +_6 3\} = \{6, 3\}$$
$$\langle 2 \rangle +_6 \langle 3 \rangle := \{2 +_6 6, 2 +_6 3\} = \{2, 5\}$$
$$\langle 2 \rangle +_6 \langle 3 \rangle := \{4 +_6 6, 4 +_6 3\} = \{4, 1\}$$

	6 3	2 5	4 1
6 2 4			
3 5 1			

Figure 4. The Cayley-Sudoku Table of $\mathbb{Z}_6$

The elements for each block of Cayley-Sudoku Table of $\mathbb{Z}_6$;

Column Brown: The elements of each block of {6, 3}

To fill out the entries for the first block, consider the following solution:

$$6 +_6 \{6, 3\} = \{6 +_6 6, 6 +_6 3\} = \{6, 3\}$$
$$2 +_6 \{6, 3\} = \{2 +_6 6, 2 +_6 3\} = \{2, 5\}$$
$$4 +_6 \{6, 3\} = \{4 +_6 6, 4 +_6 3\} = \{4, 1\}$$

	6 3	2 5	4 1
6 2 4	6 3 2 5 4 1		
3 5 1			

$$3 +_6 \{6, 3\} = \{3 +_6 6, 3 +_6 3\} = \{3, 6\}$$
$$5 +_6 \{6, 3\} = \{5 +_6 6, 5 +_6 3\} = \{5, 2\}$$
$$1 +_6 \{6, 3\} = \{1 +_6 6, 1 +_6 3\} = \{1, 4\}$$

	6 3	2 5	4 1
6 2 4	6 3 2 5 4 1		
3 5 1	3 6 5 2 1 4		

Column Green: The elements of each block of {2, 5}

Solving all the entries in this column as shown below:

$6 +_6 \{2, 5\} = \{6 +_6 2, 6 +_6 5\} = \{2, 5\}$
$2 +_6 \{2, 5\} = \{2 +_6 2, 2 +_6 5\} = \{4, 1\}$
$4 +_6 \{2, 5\} = \{4 +_6 2, 4 +_6 5\} = \{6, 3\}$
$3 +_6 \{2, 5\} = \{3 +_6 2, 3 +_6 5\} = \{5, 2\}$
$5 +_6 \{2, 5\} = \{5 +_6 2, 5 +_6 5\} = \{1, 4\}$
$1 +_6 \{2, 5\} = \{1 +_6 2, 1 +_6 5\} = \{3, 6\}$

	6	3	2	5	4	1
6	6	3	2	5		
2	2	5	4	1		
4	4	1	6	3		
3	3	6	5	2		
5	5	2	1	4		
1	1	4	3	6		

Column Violet: The elements of each block of {4, 1}

Solving all the entries in this column as shown below:

$6 +_6 \{4, 1\} = \{6 +_6 4, 6 +_6 1\} = \{4, 1\}$
$2 +_6 \{4, 1\} = \{2 +_6 4, 2 +_6 1\} = \{6, 3\}$
$4 +_6 \{4, 1\} = \{4 +_6 4, 4 +_6 1\} = \{2, 5\}$
$3 +_6 \{4, 1\} = \{3 +_6 4, 3 +_6 1\} = \{1, 4\}$
$5 +_6 \{4, 1\} = \{5 +_6 4, 5 +_6 1\} = \{3, 6\}$
$1 +_6 \{4, 1\} = \{1 +_6 4, 1 +_6 1\} = \{5, 2\}$

	6	3	2	5	4	1
6	6	3	2	5	2	1
2	2	5	4	1	6	3
4	4	1	6	3	2	5
3	3	6	5	2	1	4
5	5	2	1	4	3	6
1	1	4	3	6	5	2

Figure 5. Final Table of Cayley-Sudoku Table of $\mathbb{Z}_6$

3. Magic Cayley-Sudoku Table

A Magic Cayley-Sudoku Table is a Cayley-Sudoku Table in which the blocks are magic squares, that is, the blocks are square and the group sum of the elements in every row, column, and diagonal using the group operation is the same group element, called the magic constant.

Assume that $\{a_1, a_2, \ldots, a_n\}$, $\{b_1, b_2, \ldots, b_n\}$, and $\{m_1, m_2, \ldots, m_n\}$ is the elements in a block of a Magic Cayley-Sudoku Table.

	a_1	a_2	...	a_n	→
	b_1	b_2	...	b_n	→
	⋮	⋮		⋮	⋮
	m_1	m_2	...	m_n	→
∴	↓	↓	...	↓	⋱

Figure 6. All Sums Indicated by the Arrows are the Same

Example 3.

Let $\mathbb{Z}_3 \oplus \mathbb{Z}_3$ both a finite group with elements {00, 01, 02, 10, 11, 12, 20, 21, 22} and subgroup is $< 10 > := \{00, 10, 20\}$. Using the Construction 1.1 of Cayley-Sudoku Table.

	00	10	20	01	11	21	02	12	22
00	00	10	20	01	11	21	02	12	22
01	01	11	21	02	12	22	00	10	20
02	02	12	22	00	10	20	01	11	21
10	10	20	00	11	21	01	12	22	02
11	11	21	01	12	22	02	10	20	00
12	12	22	02	10	20	00	11	21	01
20	20	00	10	21	01	11	22	02	12
21	21	01	11	22	02	12	20	00	10
22	22	02	12	20	00	10	21	01	11

Figure 7. Magic Cayley-Sudoku Table of $\mathbb{Z}_3 \oplus \mathbb{Z}_3$ with magic constant 00

CONCLUSIONS

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

1. The concept of Cosets can be used to create or construct a Sudoku in three different ways.

2. The three methods of creating a Cayley-Sudoku Table can make three modes of Sudoku puzzle.

3. A Latin square; Cayley-Sudoku Table can be applied to another Latin square called Magic Table.

RECOMMENDATIONS

Based on the summary of findings, the researchers hereby recommended further study in the following:

1. Other way to create a Cayley-Sudoku Table and a Cayley-Sudoku Puzzle.

2. Further study on Magic Cayley-Sudoku Table.

3. Application and other related topic to Cayley-Sudoku Table.

REFERENCES

A. Books

Gallian, J.A. (1994), Properties of Cosets, Factor Group, Contemporary Abstract Algebra, {5th ed., p. 138-148, 180-187}.

Fraleigh, J.B. (2002), Subgroup, Permutation Groups, and Cosets, A First Course in Abstract Algebra {6th ed., p. 66, 94-95, 121-123}.

Ymas jr., S.E. (2013), Congruences (Modular Arithmetic), Elementary Number Theory, {2013 ed., p. 129}.

B. Journal

Carmichael, J., Schloeman, K., Ward, M.B. (2010), Cosets and Cayley-Sudoku Table, Mathematics Magazine Vol. 83, No. 2 (April 2010).

C. Thesis

Belondo, I., Garcia, J.S., Nofies, A.C., and Racho, T.O., (2008), On Sudoku Square, Unpublished Undergraduate Thesis, Eulogio “Amang” Rodriguez Institute of Science and Technology, Philippines.

D. Websites

Cayley-Sudoku Table. Retrieved from http://www.macs.hw.ac.uk/~jim/F13YR1/Notes.pdf

Cayley-Sudoku Table. Retrieved from http://www.wou.edu/~wardm/MWardCSforWeb.pdf

Sudoku Table. Retrieved from http://en.wikipedia.org/wiki/SudokuTable

Descriptive Research. Retrieved from http://fluidsurveys.com/university/descriptive-reserch-defining-respondents-drawing-conclusions

Expository Research. Retrieved from https://owl.english.purdue.edu/owl/resource/685/02

Magic Cayley-Sudoku Table. Retrieved from http://www.wou.edu/~wardm/ MagicCayleySudokuJMM2013withAddendum.pdf

APPENDIX

List of Symbols

Symbol	Definition
■	End of proof
∘	Binary operation
∈	Element
$a*$ or a'	a inverse
e	Identity element
$\mathbb{Z}$	Integer
$2\mathbb{Z}$	Even integer
$\mathbb{Z}_{9, 6, 12}$	Modulo 9, 6, 12
$\emptyset : A \rightarrow A$	One to one and onto function
σ or τ	Permutation
aH = {ah | h ∈ H}	a is the Left coset
Ha = {ha | h ∈ H}	a is the Right coset
S_3	Symmetric group of 3
$\{\rho_0, \rho_1, \rho_2, \mu_0, \mu_1, \mu_2\}$	Elements of the symmetric group of 3
m | a – b	m divides a – b
a ≡ b (mod m)	a is congruent to b modulo m
n x n array	Dimension of the table
R_nC_n	Row n in column n
n x k	Index by order
$+_{9, 6, 12}$	Modulo 9, 6, 12 under addition
< n >	Subgroup of n
T ∩ H	The intersection of T and H
$\mathbb{Z}_3 \oplus \mathbb{Z}_3$	Direct product

COMPUTERIZED COLLEGE ADMISSION AND SCHEDULING SYSTEM FOR COMPUTER TECHNOLOGY DEPARTMENT

Erwin P. Ordovez
Dennis P. Ordovez
Joseph Angelo C. Tanuecoz
Jose C. Felipe

INTRODUCTION

Enrollment system is one of the most important system, not only in a university, but also in lower levels of education [4]. It is a system designed to perform the process involved in registration, advising, assessments, and payments of students as well as scheduling of classes [3]. The purpose of this process is to provide a means for staff members and the faculty to write down data that are essential for enrollment.

The traditional process of enrollment requires paperwork and manual processes, so most of the educational institution find it difficult to maintain records on attendance, fees, admissions, transport, etc., and track the information they need [5]. Paper is an incredibly vulnerable substance. It can burn, it can be torn, it can turn to mush during a flood, and it can be stolen or misplaced. In cases of fire or flood, school systems that rely on paper files are left without a back-up plan; the data is simply destroyed. The average manual data entry error rate for humans is 1 percent, meaning that 1 out of every 100 entries is erroneous [1].

The paper-based workflow cannot scale up to the significantly larger number of students planned in the future. So the researchers would like to undertake a staged computerization of their college admission and course scheduling intended to replace what is presently a manual and paper-based workflow. The computerization will eliminate many of the manual aspects of the process and save time.

A. Statement of the Problem

The purpose of the study was to develop a Computerized College Admission and Scheduling for Computer Technology Department and it sought to answer the following questions:

1. How do the respondents assess the new system as to:

    a. Organization;
    b. Clarity;
    c. Usefulness;
    d. Practicability; and
    e. Relevance to user?

2. Is there a significant difference in the assessment of user and experts on the program?

3. What suggestion is offered by the respondents on the new system?

B. Objective of the Study

The general objective of the study is to develop a Computerized College Admission and Scheduling for Computer Technology Department specifically, it aims to:

1. Develop a program to be used in advising student during enrollment;

2. Create a databased profile of the student for the department;

3. Develop a system that can easily monitor the number of student per class during advisement; and

4. Easily monitor the maximum credit hour of the students.

C. Significance of the Study

The main output of this study will be beneficial to the following stakeholders:

1. Faculty (enrollment officer). The system will lessen the repetitive, time-consuming enrollment records monitoring tasks of the faculty of the School. The system provides posting the names and level of student and automatically generates individual student information, list of subjects, classify student in their grade level.

2. The Student. The development of the Computerized Enrollment System will make the enrollment process faster than the usual or traditional method; hence it will lessen enrollment time.

3. The Researchers. This study will enable the researchers to be more familiar with the enrollment process of student including the transferees.

MATERIALS AND METHODS

The Computerized College Admission and Scheduling is intended to be used for Computer Technology Department only. In this study, there is a need to develop a software. As shown in figure 1, the waterfall model is the most appropriate method for the program. The waterfall model consists of the following phases:

Requirement phase involves gathering data about the usual enrolment procedure of Computer Technology department to identifying the basic operation of college admission, scheduling of classes and etc.

Analysis phase, the researchers will analyze the flow and operation of the admission during enrollment.

Design phase, in this phase the researchers will design the interface of Computerized admission and Scheduling System using Visual FoxPro programming language,

Implementation Phase, the system is developed using Visual FoxPro programming language.

Testing Phase, in this phase a dummy client is entered and the system will assess all functions to know the expected output of each program. The result is recorded and bugs are edited.

Deployment Phase, in this phase the Computerized College Admission and Scheduling system will deploy in the Computer Technology department under the college of Industrial Technology

Maintenance Phase, in this phase installing and updating of the software requirement. Changes of the settings in the administration and operation of the admission as well as to the needs of client is indispensable.

Figure 1. Waterfall Model

In figure 2 shows the top level of the data flow diagram of system. The student information will verify the status of the student if it is new or old. If the student is new it will proceed to registration process and save it in the student information table. But if the student is old, it will proceed to the advising process which the student will give the subject and schedule then the data will automatically be save in the table. The system then will generate advisement slip of the student.

The faculty (enrollment officer) is in-charge for encoding the subject and schedule on the system and save it in the subject and Schedule table.

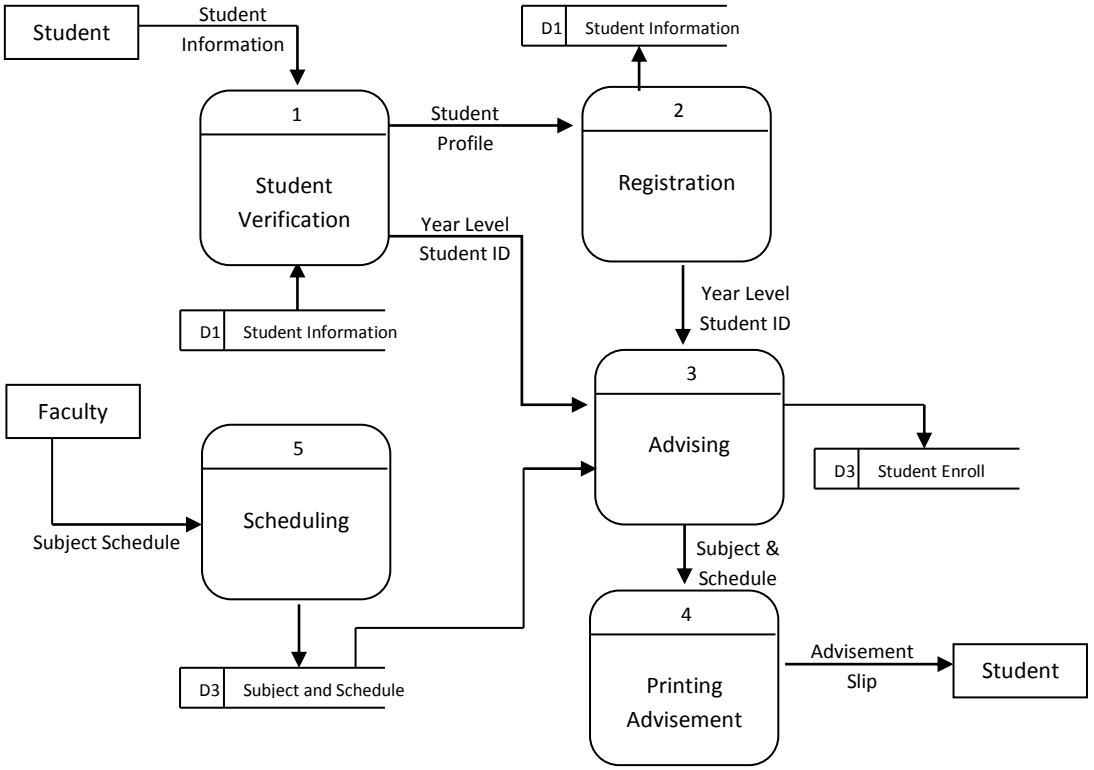


Figure 2. Data Flow Diagram (Top Level)

STATISTICAL TREATMENT OF DATA

The following statistical tool for interpretation of the results according to the sub-problems will be used:

1. **Weighted Mean**

This was used to determine the representative assessment of the users and experts in the term of organization, clarity, usefulness, practicability and relevance to the user.

$$\overline{X} = \frac{\sum fx}{n}$$

Where:

$\overline{X}$ = weighted mean
$\sum fx$ = total frequency
N = number of responses

It is a measure of central tendency that reflects the respondent's perception. For the purpose of scoring the responses, the following criteria were used in this study.

Range	**Verbal Interpretation**
4.50 – 5.00	Very High Acceptable
3.50 – 4.49	Highly Acceptable
2.50 – 3.49	Acceptable
1.50 – 2.49	Moderate Acceptable
1.00 - 1.49	Least Acceptable

2. **T-test**

This tool was used to find out the significant difference of the two groups respondents on the developed data-based enrolment system for the college of education: graduate program.

$$T = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Where:

T =computed t-value
$\overline{X_1}$ = mean of the first group
$\overline{X_2}$ =mean of the second group
S_1 =variance of the first group
S_2 = variance of the second group
N_1 = number of respondents in the first group
N_2 = number of respondents in the first group

3. **Percentage.**

As defined in the world book dictionary, percentage is a rate or portion of each hundred. It is computed by dividing the frequency with the sample. It is used to determine which item in group favored.

$$P = \frac{f}{N} \times 100$$

Where:

f =frequency
n =sample
P =percentage
100 =constant multiplier

RESULT AND DISCUSSION

Table 1

Summary Table of the assessment of the two Groups of Respondents on the level of acceptability of the Computerized College Admission and Scheduling System for Computer Technology Department in term of the Afore cited Variables

Criteria	User		Expert		Composite Mean	
	M	VI	M	VI	M	VI
Organization	3.97	HA	4.15	HA	4.06	HA
Clarity	4.03	HA	4.20	HA	4.11	HA
Usefulness	4.14	HA	4.20	HA	4.17	HA
Practicability	4.31	HA	4.15	HA	4.23	HA
Relevance to User	4.03	HA	3.95	HA	3.99	HA
Composite Mean	4.09	HA	4.13	HA	4.11	HA

Table 1 presents the summary of the assessment made by two groups of respondents on the level of acceptability of the computerized college admission and scheduling system for Computer Technology Department in terms of the afore cited variables.

The overall composite mean of the groups of respondents was 4.11 interpreted as highly cceptable.

CONCLUSIONS

Based on the finding of the study, the following conclusions were hereby drawn:

1. The computerized college admission and scheduling system was developed in order to improve the procedure of enrollment in the college.

2. As a whole, the two groups of respondents assessed the computerized college admission and scheduling system for Computer Technology department as highly acceptable in terms of organization, clarity, usefulness, practicability, and relevance to the user.

3. There was no significant difference between the assessments of the two groups of respondents as to the level of acceptability of the computerized college admission and scheduling system for Computer Technology Department in terms of the considered variables. They both assessed it as highly acceptable.

RECOMMENDATIONS

In the light of the findings and conclusions drawn, the following recommendations are hereby forwarded:

1. The assessed computerized college admission and scheduling system may be used for enrollment in the College of Industrial Technology.

2. Occasional checking of the network connection is required.

3. Funds may be allotted in the design, implementation, and maintenance of the program.

REFERENCES

[1.] Newman M. “5 Common Errors with Manual Registration”;2017

[2.] Patrick H.H. “Online Student Enrollment System” School of Information Technology 2015

[3.] Pearl Jean. “A Proposed Computerized Enrollment System” https://prezi.com/ky469pwgmfjf/a-proposed-computerized-enrollment-system-for/ 2016

[4.] Bartleby.com “Introduction to Enrollment System”. https://www.bartleby.com/essay/Introduction-To-Enrollment-System-P3HDP49KRYYS. 2014366

[5.] Creative Campus. “Top 1- issues around school management and how to solve them easily.” https://www.creatrixcampus.com; 2017

STRATEGIES IN HANDLING COMPLAINTS IN SELECTED FAST FOOD RESTAURANTS IN SM DASMARIÑAS CITY, CAVITE: FRAMEWORK FOR SERVICE ENHANCEMENT

Yvonne O. Orozco
Enrico Abasolo
Edzel G. Peña

INTRODUCTION

Restaurant is a place where you can find, purchase and eat an appetizing meal. Restaurateurs are the ones who own and manage the business. Employees and staffs are the persons who do the operation and welcome customers inside the business. It is important that a restaurant must recognize complaints as opportunities, so that they can retain their customers and will not spread a bad word-of-mouth. Managing customers' complaints, problems, and issues is part of being in the business most especially in restaurants.

Feedbacks from customers are necessary, it should be dealt positively by food establishments for improvement and proper handling for business to grow and not lose the customers' patronage. Through these, they give hints to restaurant or other food establishments to improve their services regarding the product, food, service, facility or maybe a combination of the three. Managing the complaints well and providing good customer service is about more than just keeping customers happy. Management must take care of the customers by listening to the complaints, and resolving it rapidly, to ensure that the customers are satisfied.

The researchers conducted this study in selected five (5) fast food restaurants in SM City, Dasmarinas, Cavite namely Jollibee Foods Corporation (JFC) or popularly known as Jollibee. Second was Chowking located at SM Dasma Unit 224-226 on the second floor. Third, was Mang Inasal, a Hiligaynon for Mr. Barbeque fast food restaurant chain in the Philippines established in Iloilo City in 2003. Mc Donalds the largest chain of hamburger fast food restaurants headquartered in the United States serving around sixty-eight (68) million customers daily in one hundred nineteen countries across thirty-five thousand (35,000) outlet and Burger King often abbreviated as BK, a global chain of hamburger fast food restaurants headquartered in unincorporated Miami-Dade County, Florida, United States. The purpose of this research was to investigate how service employees handle customer's complaints and how do food establishment such as restaurants use their strategies in managing customer's complaints, and how they create impact in the management of restaurants. Therefore, this study would like to find out how do management give remedies and treat their customer's complaints rapidly.

MATERIALS AND METHODS

The descriptive type of research design was used in this study. This involved collection of data in handling customers complaints, food service and food preparations collected, also the common complaints raised by those customers, ways of handling of the personnel, those effects of the customers feedback on how restaurant managers and personnel handle complaints. It describes and interprets the effectiveness of the strategies they used in selected fast food restaurants in SM City, Dasmarinas Cavite. The study was composed of three (3) personnel and staff and thirty (30) customers in each fast food restaurants.

The research instrument used in gathering of data was the questionnaire formulated by the researchers and validated by the adviser to answer the specific sub-problems raised in the study. Survey questionnaire was used to gather data on the strategies use in handling

customer complaints in selected five (5) fast food restaurants in SM City, Dasmarinas, Cavite. There were 2 sets of questions. The first one was for the assessment of the managers/staff and customers on the fast food restaurants. The questions included the concern about the services and the working area and the way they serve. The second set determined the assessment of managers/staff and customer in the strategies in handling customer complaints.

Statistical tools were used as basis of interpretation of data such as frequency, percentage, ranking and weighted mean.

RESULTS AND DISCUSSIONS

Table 1

Summary of the Assessment of Managers/Staff and Customers on the Service Rendered by the Fast Food Restaurants

SERVICE	MANAGER/STAFF		Customer		Composite		Rank
	Mean	Int.	Mean	Int.	Mean	Int.	
1. Restaurant Operation	3.53	SO	3.59	SO	3.56	SO	4
2. Food	3.90	SO	3.95	SO	3.93	SO	1
3. Beverage	3.78	SO	3.66	SO	3.72	SO	2
4. Hygiene And Sanitation	3.53	SO	3.54	SO	3.54	SO	5
5. Personnel Behavior	3.56	SO	3.57	SO	3.57	SO	3
COMPOSITE MEAN	**3.66**	**SO**	**3.66**	**SO**	**3.66**	**SO**	

As shown in Table 1, summary of the assessment of the managers/staff and customers on the service rendered by the fast food restaurants. The highest rank identified problem is given to the Food with its composite mean of 3.93 interpreted as sometimes practiced, while the lowest rank with its composite mean 3.54 interpreted as sometimes practiced is given to Hygiene and Sanitation.

As shown in Table 2, assessment of the manager/staff and customers on the strategies. The highest rank is given to the criteria Assure customer to fix their problem with the composite mean of 4.24 interpreted as always practiced while the lowest rank is given to the criterion Listen empathetically while stating the problem.

SCALE	RANGE	VERBAL INTERPRETATION	LEGEND
5	4.2-5.0	Always Practised	A
4	3.1-4.19	Sometimes Practised	SO
3	2.6-3.39	Often Practised	OP
2	1.8-2.59	Seldom Practised	SP
1	1.0-1.79	Never Practised	NP

Table 2

Assessment of the Manager/Staff and Customers on Strategies

Strategies	Manager/Staff		Customer		Composite		Rank
	Mean	Int.	Mean	Int.	Mean	Int.	
1. Immediately response to resolve any problem that might arise.	4.77	A	3.59	SO	4.18	SO	7.5
2. Listen empathetically to customer while stating the problems.	4.73	A	3.61	SO	4.17	SO	10
3. Do not argue with the customer.	4.81	A	3.58	SO	4.20	A	4
4. Patient in handling customer complaint.	4.79	A	3.56	SO	4.18	SO	7.5
5. Jot down important details about the problem.	4.71	A	3.65	SO	4.18	SO	7.5
6. Thank to the customer for complaining.	4.83	A	3.58	SO	4.21	A	2
7. Apologize to the customer of having bad experience.	4.81	A	3.58	SO	4.20	A	4
8. Offer a solution or remedy to the customer's problem.	4.79	A	3.57	SO	4.18	SO	7.5
9. Let the customer vent out about the problem without interruption.	4.79	A	3.61	SO	4.20	A	4
10. Assure the customer to fix their problem.	4.75	A	3.72	SO	4.24	A	1
Average weighted mean	**4.78**	**A**	**3.61**	**SO**	**4.19**	**SO**	

CONCLUSIONS

The highest identified problems encountered came from food served by the restaurant, followed by problems encountered on beverage, next was in terms of personal behavior of staff, then, problems in restaurant operation and lastly problems encountered in connection with hygiene and sanitation. The assessment given by the managers/staff and customers on the service rendered as to restaurant operation the common problem encountered by the two groups of respondents was to give correct billing to the customer. As to food, was the criterion give proper serving appropriate to its price. As to beverage, was serve the drinks with fresh ingredients. As to hygiene and sanitation was wearing proper uniform like apron, hairnet and face mask. As to personal behavior greet and smile to the customers when entering the restaurant.

Assuring customer to fix their problem was the most important strategy to handle customer's complaints based on the assessment of the manager/staff and customers. This strategy may instantly relieve the tension between the customer and staff and avoiding greater argument and conflict. On the other hand, listening empathetically to the customer was the least among the strategy implemented in handling customer's complaints.

RECOMMENDATION

Based on the findings gathered from the two groups of respondents with the problems detected in the formation of variables was in terms of hygiene and sanitation , the commended things to do with the managers and staff is to enhance their service through cleanliness and orderliness. To support the recommendation, the managers and staff should abide by the

standards that should be given to the customers. To supplement the recommendation, the researchers came up with a framework for service enhancement to the restaurant owners, managers and staff. (see appendix A) It can be applied by the managers on what is the best solution for the problem in terms of customer complaint.

REFERENCES

BOOKS

Judalena, Julius Cesar Q. 2013. Handling Guest Complaint Mc Millan, John. 2009. *Better Practice Guide Complaint Handling. Commonwealth Ombudsman*, April Swyers,Matthew, 2012. *Five Steps In Handling A Customer Complaint*. November 7.

JOURNALS/PERIODICALS

Bin, Wei.,Yan, Song. 2011. Crucial Factors In Customer Relationship Management. 2011

Davidow M. "The Bottom Line of Impact of Organizational Responses to Customer Complaints". Journal of Hospitality & Tourism Research 2000;24; p.473-490.

Lam, Terry., Tang,Vienna 2008. Recognizing Customer Complaint Behavior The Case Of Hong Kong Hotel j j I k I Restaurant S. October 14.

Tronvoll,Baird. 2008. Customer Complaint Behavior In Services, Karlstad University

Voss, Roediger. 2009. Developing A Deeper Understanding Of The Attributes Of Effective Customer Contact Employees In Personal Complaint Handling Encounters

THESIS/DISSERTATION

Ah Yoo, Seung. 2012. Customer Perceptions Of Cleanliness:A Cross Cultural Study. Blacksburg. Virginia

Ali Wasare, Bashir. 2008. The Impact Of Consumer Complaints Handling On Complaintant Satisfaction And Behavioral Outcomes A Study Among The Telephone Services Paradise In Mogadishes,Somalia. Universities Malaysia

Bagdish.Saeed.,Fletcher,Richard., Stanton, John. 2010. Causes Of Consumer Complaint Behaviour In Saudi Arabia: A Proposal Framework.

Bentulan,Mary Joy F. Et. Al 2008.Handling Restaurants Customer Complaints

Blodgette, Jeffrey. 2009. The Effects Of Customer Services On Consumer Complaining Behaviour

Castillo, Nicole., Blankvard, Lena. Service Recovery: How Companies Handle Customer Complaints

Gelbrich, Katja., Roschk, Holger. 2010. A Meta-Analysis of Organizational Complaint Handling And Customer Responses

Gursay, Dogan. 2008. Segmenting Dissatisfied Restaurants Customer Based Their Complaining Response Styles. September, 8

Homburg, Christian., Furst,Andreas. 2010. See No Evil, Hear No Evil, Speak No Evil: A Study Of Defensive Organizational Behaviour Towards Customer Complaint.

Kim, Jooher. 2011. Influencing Factor On Customer Intention To Complain In A Franchise Restaurant. January,7

Ngai, Eric W.T 2010. Consumer Complaint Behaviour Of Asians And Non Asians About Hotel Services; An Empirical Analysis

Park , Seul G. 2014. Complaint Behaviour Intensions And Expectations Of Service Recovery In Individualisti And Collectivistic Cultures

Shaw, James G. 2011. Triple Customer Complaints : Boost Profits By Capturing The Customer Point Of View Sexond Edition

Szimigin, Isabelle Et Al. 2009. Handling Customer Complaints Effectively , A Comparison Of The Value Maps Of Female And Male Complainants

Tantawy, Aida. 2008. An Assessment Of Hotel Guest Contact Personnel In Handling Guest Complaint . November,17

Wong, June. Customer Opportunistic Complains Management: A Critical Incident Approach

ONLINE SOURCES

Customer Expression I-Sight. Handling Customer Complaints: A Better Practice Guide. Copyright 1999-2015.

http://www.referenceforbusiness.com/history2/63/EgyptAir.

html (16 February, 2013)

http://www.goodfellowpublishers.com

www.ombudsman.gov.au 1300 362 072

www.kau.se

APPENDICES

APPENDIX A

SERVICE ENHANCEMENT PROGRAM

S OBJECTIVE	PROGRAM	PERSON INCHARGE	TIME FRAME	BUDGET NEEDS	TOOLS	PROCEDURE
To enhance employees' interpersonal and strategic skills in handling customer complaints.	Seminar and training in interpersonal skill and handling customer complain.	Restaurant owner, TESDA trainer	1 week	P1000	Notepad,pen, ID.	Visit any nearest TESDA Training Center. Get the registration form to the office of the company and filled up the form. Prepare all the necessary requirements for the training. TESDA certification passers have to apply for the certification, additional requirements maybe requested by the training institute.
To develop a training module on health risk assessment related to food.	Attend a gourmet seminars by TESDA	Restaurant owner, TESDA trainer	1 week to 3 weeks	P1500	Notepad,pen, ID Laboratory uniform,Lapto p	Visit the official website of the TESDA Training Centre or, Visit any nearest TESDA Training Centre. Get the registration form to the office of the company and filled up the form. Prepare all the necessary requirements for the training. TESDA certification passers have to apply for the certification, additional requirements maybe requested.
To establish safety and sanitation standard procedure in the establishment .	Registered to the FDA, BFAD, DOH.	Government official in any department.	3 weeks to 1 month	P4000	Pen, laptop, Notepad	Go to the government office to take a examination for the license. Get the registration form to the office of the company and filled up the form. Prepare all the necessary requirements for having a permit. Wait for the schedule given by the personnel.
To develop a service enhancement training on the health risk related incidents on the beverage that is served to the customer.	Attend a Seminar, Training, by TESDA with the supervision of Department of Health (DOH)	Restaurant Owner with the supervision of TESDA Trainer and Personnel Government Official	1 week to 3 weeks	P3500	Notepad,pen and Laptop.	Prepare all the necessary requirements for the seminar and training. Visit any nearest TESDA Training Center. Get the form and filled up (indicate your I.D resume and picture). Go to the cashier to pay for the assessment including the following requirements, and wait for the schedule. And for the DTI Go to the government office to take a examination for the license to get a permit for the training.
Design strategic plan to maintain the customer loyalty.	Seminar, Orientations by the Restaurant Owner.	Restaurant Owner and Staff.	2 weeks	P4500	Notepad,pen or Laptop much better.	Prepare all the necessary requirements for the orientation (I.D, Invitation, Evaluation).

LEARNING AND TEACHING WITH COURSE ANALYTICS IN CURRICULUM OF SENIOR HIGH SCHOOL TRANSITION

Jesus Paguigan
Merlita C. Latip
Dr. Melvin Ballera

INTRODUCTION

The analysis of data collected from the interaction of users with educational and information technology has attracted much attention as a promising approach for advancing our understanding of the learning process. This promise motivated the emergence of the new research field, learning analytics, and its closely related discipline, educational data mining [1].

The effective school educators have always used evidence to inform their practice to optimize student learning. The course and program transition was increasingly delivered by the technology which enabled by online modes, the need to find a new ways of seeing the students to be better understand the impact of the learning designs and pedagogical practices in how students engage, behave, and perform in the course.

Predictive analytics techniques applied to a broad swath of student can aid in timely intervention strategies to help prevent students from failing a course [2].

The emerging fields of academic analytics and educational data mining are rapidly producing new possibilities for gathering, analyzing, and presenting student data. Faculty might soon be able to use these data sources as guides for implementing new assessments and lines of communication between instructors and students. This essay links the concepts of academic analytics, data mining in higher education, and course management system audits and suggests how these techniques and the data they produce might be useful to those who practice the scholarship of teaching and learning. [3].

Statement of the Problem

Specifically, this study wanted to seek answers to the following questions

1. What is the status of the data and evidence to inform the educational practice?

2. What are the capacities to design and deliver engaging an impact learning environment?

3. How to support student's achievement and well-being scale?

4. How to support number of strategic agendas to the school?

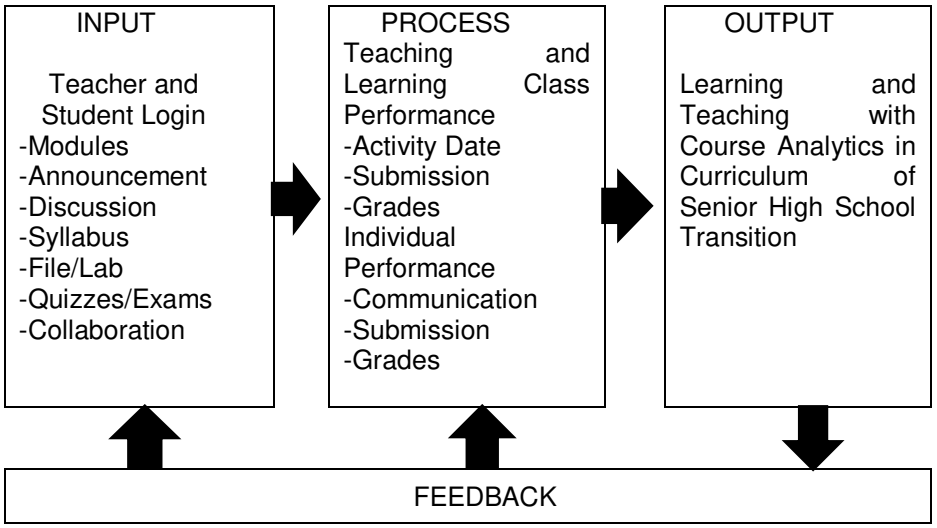
5. Is there significance difference between the faculty and the student?

An application of learning analytics that builds on an existing research program investigating how students contribute and attend the messages of others in online discussions. A pedagogical model that translates the concept and findings of the research program into guidelines for practice and analytics with which students and instructors can assess their discussion participation are presented. The analytics are both *embedded* in the learning

environment and *extracted f*rom it, allowing for integrated and reflective metacognitive activity [4].

Learning analytics is receiving increased attention, in part because it offers to assist educational institutions in increasing student retention, improving student success, and easing the burden of accountability. Although large-scale issues are worthy of consideration, faculty might also be interested in how they can use learning analytics in their own courses to help their students succeed [5].

Conceptual Framework



The role that the assessment could play within a learning analytics strategy is both significant and, as yet, underdeveloped and underexplored. It proposes that assessment analytics has the potential to make a valuable contribution to the field of learning and academic analytics by both broadening is scope and increasing its usefulness. In doing so it considers issues of operationalization and then moves on to define what we might understand as assessment analytic [6].

Objective of the Study

Once learning analytics have been successfully developed and tested, the next step is to implement them at a larger scale—across a faculty, an institution or an educational system. This introduces a new set of challenges, because education is a stable system, resistant to change. Implementing learning analytics at scale involves working with the entire technological complex that exists around technology-enhanced learning (TEL).

This includes the different groups of people involved – learners, educators, administrators, and support staff – the practices of those groups, their understandings of how teaching and learning take place, the technologies they use and the specific environment within which they operate. Each element of the TEL Complex requires explicit and careful consideration during the process of implementation, in order to avoid failure and maximize the chances of success. In order for learning analytics to be implemented successfully at scale, it is crucial to provide not only the analytics and their associated tools but also appropriate forms of support, training and community building [7].

This study was conducted with the following objectives:

1. To enhance the review and design of the courses.

2. To enabling personalized support and feedback of the students.

3. To encourage the regular evaluation and understanding of the learner engagement.

4. Empowering the students to proactively manage the learning and success.

5. To evaluate the impact and value of learning and teaching intervention.

6. To assess the significance difference the Teacher and students.

METHODS

The course analytics allow to assess how effective the online teaching methods are identify areas that could improve, as well as identify at-risk students. Course analytics composed of Activity tracks, pages views and participation for each student. Assignment which tracks assignment submission relative to the due date, grades which shows the grade distribution for the course and student analytics which shows activity assignment and over all current grades for individual students.

These data can allow identifying problems in the course design which tools students seem to be benefiting from, and identify students that are not doing well. The following pages will go into detail on how to view and interpret these different components.

The course analytics would show the activity, assignment submissions, grades, and students. It can view analytics in both active and concluded courses. Course analytics are a useful tool for finding out how students are interacting with the course site especially for the senior high school transition [8].

RESULT AND DISCUSSION

Class Performance

The activity by date graph showed all course activity for all students in the course. The x-axis represents the courses dates, while the y-axis represents the number of page views. Dark blue bars represent participation of the student in the course. The date only includes page views, the bar only displays as light blue.

The graph changes the bar display according to the length of time. The activity that is less than four months old displays bars as daily activity, at four months bars are displayed as weekly activity, and at approximately a year bars are displayed as monthly activity. The view details of the bar graph hover over the specific bar that wants to view. The weekly view shows the first and last date for the week; the monthly view shows the month and the year.

The submissions graph shows the status of each assignment in the course. The x-axis represents the assignments, while the y-axis represents the percentage of submissions for all students in the course. The green rounded shape at the bottom of the bar indicates how many students have not submitted the assignment.

The Grades shows the median, high, and low scores for an assignment. The x-axis represents each assignment, while the y-axis represents the number of points for assignment. The vertical blue line extends from the lowest score to the highest score. The blue box extends from the 25th to 75th percentile. The horizontal black line shows the median score for the assignment. The gray lines indicate the muted assignments.

The teacher can view the student name, page views, participations, and submissions. Submissions show how many published and graded assignments each student is assigned in the course. Submissions are also broken down according to how many submissions were on time, late, and missing. An assignment only count as missing if the due date has a passed and it has not been submitted. You can also view a student's current score percentage, which is their score in the course.

Individual Performance

The Communication graph shows the conversations that have taken place with the teacher through the inbox. The x-axis represents the user type; orange message icons show when you sent a message to the teacher and blue message icons show when s teacher sent a message to you. They can view the date of the communication and how many messages were sent. A message is an individual message passed from one user to the other; in message threads, each message is individually counted. In group conversations, interactions are counted as long as you were one of the recipients.

The submissions graph shows the status of each of your assignment submissions. The x-axis represents each assignment, while the y-axis represents the submission date. The green circle indicates an assignment that was submitted on time. The yellow triangle indicates an assignment that was submitted late. The red square indicates an assignment that is missing (not submitted). The diamond indicates the due date and the bar extends to the submission date. A white circle with a black outline indicates an assignment with a future due date.

If a submission includes a due date, the submission may include horizontal line. The line indicates when the assignment was submitted, while the shape indicates the actual due date. If a submission was submitted before the due date, the horizontal line is green; if it was submitted after the due date, the horizontal line is yellow. Submissions without horizontal line either have no due date, or the assignment was submitted on due date.

The grades graph shows the median, high, and low scores for each of your assignments. The x-axis represents each assignment, while the y-axis represents the number of points for an assignment.

The vertical black line extends from the highest score to the lowest score. The gray box extends from the 75th percentile to the 25th percentile. The horizontal black line shows the median score for the assignment.

Each assignment score is indicated by the same shapes found in the Submissions graph. The green circle indicates an assignment that was submitted on time. The yellow triangle indicates an assignment that was submitted late. The red square indicates an assignment that is missing (not submitted) [9].

Analytic allows the discovery and communication of patterns and relationships hidden within date. In the context of education, capturing deeply granular date offers educators the potential to gain previously unobtainable insights into the learning process and allows them to make data-informed decisions. This paper discusses the analytics made available through the realize it adaptive learning platform. These can largely split into two groups; Learning

Analytics which focuses on institutional level insights. In particular the latter will be emphasized by presenting a series of modular outputs from the analytics being run on real English Composition course delivered through realize it. These modular components will highlight some of the potential insights that available from educational data [10].

CONCLUSION

In this study the researchers conclude that today, the world of data was constantly changing and the ways to address the data issues was always evolving. The courses aim at covering the foundation of data preparation and it's applicable in different education problem. Course analytic technology holds great deals for helping the educators. And the institutions to better understand the student learning outcomes and become more efficient in targets of course, instructional and support resources to improve the student learning.

ACKNOWLEDGEMENT

The Authors want to give their uttermost gratitude to Dr. Melvin Ballera, PhDCS for sharing his pearls of wisdom during the course of the research and ongoing Dissertation of the author. The author also would like to thank their family and friends for extending moral and intellectual support to this research.

REFERENCES

[1.] Gasevic, D., Dawson, S., & Siemens, G. (2014, December 21). Let's not forget: Learning analytics are about learning.

[2.] Dawson, S., J, S., Dawson, E. S., & Haythornthwaite, C.A. (2012). LAK 2012: Proceedings of the 2nd International Conference on Learning Analytics and Knowledge: April 29-May 2, 2012, Vancouver, British Columbia, Canada.

[3.] Baepler, P., & Murdoch, C. (2010). Academic Analytic and Data Mining in Higher Education, International Journal for the Scholarship of Teaching and Learning, 4 (2).

[4.] Wise, A. F., Zhao, Y., & Hausknetch, S.N. (2013). Learning analytics for online discussions. Proceeding of the Third International Conference on Learning Analytics and Knowledge-LAK 13

[5.] Berry, L. J. (2013). Using Learning Analytics to Predict Academic Success in Online and Face-to-face Learning Environments. Journal of Interactive Online Learning.

[6.] Ellis, C. (2013). Broadening the scope and increasing the usefulness of learning analytics: The case for Assessment analytics. British Journal of Educational Technology, 44(4)

[7.] Ferguson, R.., Clow, D., Macfadyen, L., Essa, A., Dawson, S., & Alexander, S. (2014). Setting learning analytics context. Proceedings of the Fourth International Conference on Learning Analytics And Knowledge- LAK 14.

[8.] Irimia R, Gottschling M (2016) Taxonomic revision of Rochefortia Sw. (Ehretiaceae, Boraginales). Biodiversity Data Journal 4: E7720.

[9.] Howlin, C. & Lynch, D. (2014). Learning and Academic (Ed.), Proceedings of World Conference on E-Learning (pp. 862-872).

NATURAL PLANT BASED PIGMENT: AN ALTERNATIVE USE FOR PAINTING MEDIA

Roger D. Ramos
Aldwin F. Amorin

INTRODUCTION

The ancient art of painting has been used by almost all civilizations of antiquity. Long before the invention of chemical paints, humanity only used natural sources for obtaining colors. The pleasure of working with natural paints is that it is never bored and always you can find new sources of color. We all knew the highly renowned painting of the master painter the great Leonardo Da Vinci, "The Last Supper", the painting was painted with natural based pigments where the method used was grinding the materials until today. The said painting hung on the dining wall of Santa Maria delle Grazzie in Milan, Italy a monastery and still in perfect condition as the painting scholars say it will last another century because of its natural based colors.

Pigments may be organic or inorganic. Inorganic pigments looks brighter but it will not last longer than organic ones. Organic pigments made from natural sources have been used for centuries, but most pigments used today are either inorganic or synthetic organic ones.

Extraction is a separation technique used to remove or separate one compound from a mixture. In the case of pigments or inks, this method was used to get the desired color from the natural or synthetic source.

The most common natural pigments are chlorophyll (the green color), beta carotene the (orange color) and lycopene (the red color).

OBJECTIVES

1. To identify major pigments occurring naturally in plants: chlorophyll (green), carotenoids (yellow, orange and red), and anthocyanins (red, purple and blue).

2. To use the pigments found in plants and trees to make natural pigments and to use these pigments/ organic paint material for painting.

3. To use the pigments as an alternative painting media for painting creative artworks to be sold locally and internationally.

4. To link the lesson to fine arts by extracting pigments from plants and fruits as the material for water based coloring paint media.

RELATED LITERATURE AND SIGNIFICANCE OF THE STUDY

This is the continuation of the soil painting research on the Talaandig tribe of Bukidnon. Instead of using the usual coloring materials for painting, they use what is readily available and abundant in their environment, the soil. Natural pigments produced by soil makes an extraordinary diversity of rich and complex colors, making them exciting to use. Pigments obtained from plants are more vivid in terms of its rich color texture. Pigments extracted from

plants are much easy to apply on paper because of the fine smooth compound properties and the diversity of its fluid contents, Natural colors are great motivators and easy to design with. It can be very satisfying to grow our own rich pigmented plants and produce our own colors of rich and complex colors as well as unexpected results, making the pigments easy to use in designing natural colors as they complement each other well and rarely clash. Synthetic pigments, on the other hand, often look bright and garish and they require more skill in color matching. It can be easily told that growing and extracting rich pigmented plants can be use anywhere and anyone without buying expensive synthetic, pigments too many artists are harmful to health. We are alarmed by the death of one of our former student it is because of his doctors diagnosed that he had an emphysema and lung complication due to harmful vapors from the chemicals he inhaled probably from the chemically produced paints and pigments he has worked into. The said deceased student is a fulltime artist by profession. So, the researchers came up with the idea of making a study of natural based pigments for alternative painting media, the researchers are also painters. Many individuals and groups will benefit with this study, especially art students, hobbyists and art lovers alike. The researchers re-envisions our relationship to nature, proposing new ways for us to co-exist with our environment

METHODOLOGY

Practical method or the hands-on approach of research was used in the conduct of this study; several chosen art students were the key respondents of the research.

RESULTS AND DISCUSSIONS

Learn the difference between pigments and dyes and how they affect art in general. The arts and crafts world can sometimes be rather confusing because terms get tossed around with the assumption that the reader and user know the meaning, but the terms were seldom defined. The terms “pigment” and “dye” are two different terms.

Pigments are colored, white or fluorescent particulate organic or inorganic solids which usually are insoluble in, and essentially physically and chemically unaffected by, the vehicle or substrate in which they are incorporated. They alter appearance by selective absorption and/or by scattering of light. Pigments are usually dispersed in vehicles or substrates for application, as for instance in the manufacture or inks, paints, plastics or other polymeric materials. Pigments retain a crystal or particulate structure throughout the coloration process.

Dyes are intensely colored or fluorescent organic substances only, which impart color to a substrate by selective absorption of light. They are soluble and / or go through an application process which, at least temporarily, destroys any crystal structure by absorption, solution, and mechanical retention. The study came up with the conclusion that natural plant based pigments are much easier to work with in terms of its fluidity and smoothness in applying to paper and fiber.

FINDINGS

Using plant based pigments was not as easy to prepare but to use as painting media was intricate and it was not easy to introduce other form of media to people who are already accustomed to the media they are used to. Plant based pigments is much easier to apply on paper ground it because it’s form from liquid state when extracted from its source.

CONCLUSION

Extracting leaf and fruit extracts is predominantly an artifact. The boiling method would be a practical choice when leaves are not too thick. However, it may convert a small fraction of chlorophyll. But the best method of extracting pigments from plants is the grinding method to produce pure pigments.

RECOMMENDATIONS

The researchers highly recommend that further studies and cooperation from the art communities should do their part of using natural based pigments on their artworks to save our environment and lessen the use of synthetic based pigments because of its harmful effects on the artist. . The researchers envision our relationship to nature, by proposing new ways of painting methods and materials to be used by art enthuiasts for us to co-exist with our environment.

REFERENCES

Textile Fashion Study: Difference between Pigments and Dyes

The Blue Bottle Tree: by Ginger Davis Allman

GreenMuseum.org

WOODTITLE: TWO-DIMENSIONAL LOGO OF DIFFERENT COLLEGES OF EULOGIO "AMANG" RODRIGUEZ INSTITUTE OF SCIENCE AND TECHNOLOGY MADE OF SAWDUST, CHEAP BOARD AND WOOD

Dindo D. Ramos
Enrique R. Sotto
Teresa J. Herrera

I. Introduction

Saw dust was used in various visual expressions such as sculpture and decorative arts. It is a cheap and alternative material for sculpture, wall decorations and hanging decorative objects.

The Eulogio "Amang" Rodriguez Institute of Science and Technology (EARIST) logo was made and expressed creatively using sawdust, cheap board, wire, glue and wood. These discarded materials were used for the logo of the different colleges of Eulogio "Amang" Rodriguez Institute of Science and Technology namely; College of Architecture and Fine Arts, College of Engineering, College of Industrial Technology, College of Business Administration, College of Arts and Sciences, College of Education, College of Public Administration and Criminology and Graduate School, were treated and used to the maximum to create the two-dimensional logos.

This research was conducted to help the students of Fine Arts to be creative and expressive using sawdust as an alternative material for creating two-dimensional logo.

II. Objectives of the Study

The main focus of the study is the shape and form, the total appearance, the construction of the different logo of the EARIST colleges made of sawdust, specific objectives are as follows:

1. Prepare sketches/ studies with complete specifications and details
2. Prepare the materials, tools, and procedures in the construction of logo of the different EARIST colleges.
3. Assemble and construct the armature to support the outer materials.
4. Evaluate the strength and defects to improve the quality and craftsmanship.

III. Development of the Project

III. a. Supplies and Materials

The table below shows the tools, supplies and materials used for construction of eight colleges logo of EARIST:

Quantity	Unit	Description	Unit Price	Amount per logo	Total
10	Kilos	Fine Sawdust	3000	300.00	2,400.00
1	Piece	Cheap board # 30 20"x 30"	45.60	45.60	364.80
2	Kilos	Common wire	60.00	120.00	960.00
1	Gallon	White glue	480.00	480.00	3,840.00
1	meter	Chicken wire	78.00	78.00	624.00
10	Pieces	screw	12.00	120.00	960.00
4	Sheets	Sand paper	6.00	24.00	192.00
4	gallons	White Elastomeric paint	750.00		750.00
1	liter	Thalo Blue	220.00	220.00	1,760.00
1	liter	Hansa Yellow	230.00	230.00	1,840.00
1	liter	Lamp Black	220.00	220.00	1,760.00
1	liter	Toulidine Red	230.00	230.00	1,840.00
2	cans	Clear Gloss	240.00	480.00	3,840.00
4	Pieces	cutter	12.00	48.00	384.00
1	Piece	Copping saw	180.00	180.00	1,440.00
1/2	piece	¼" Plywood	210.00	210.00	1,680.00
			Total =		**24,634.8**

III. b. Construction Procedure

The following are the steps in the construction of the EARIST logo:

1. Make a drawing /sketch of EARIST logo showing its front view, right and left side views, and rear view
2. Construct the armature using screws attached to the wooden base supporting the EARIST logo
3. Prepare all the materials and tools needed in the construction
4. Cut the letters and images from the cheap boards
5. For the preparation of the mixture of the sawdust, measure the sawdust and white glue with a measuring cup with a ratio of one cup of glue and five cups of fine saw dust
6. Use plastic basin for mixing the glue and sawdust
7. Start putting the mixed sawdust directly to the armature and to the surface of the base of the logo to make it firm and stable
8. Let the sawdust become firm before another layer will be blended
9. Carefully check the pasted and blended mixture to the armature to avoid deformity during the construction
10. Continue pasting the mixture, spreading them together with your figures
11. Pasting the letters and other images on the damp mixture, using carving tool or similar tool to complete the shape or image of the EARIST logo.
12. Let it dry naturally for five weeks

13. When the surface has dried up completely, start sanding and retouching the surface of the whole EARIST logo

14. Then spray the surface with an enamel-based paint

Finished Product:

Two-Dimensional EARIST eight Colleges Logos

IV. Summary of the Findings

Based on the objectives of the study, the following are the salient findings:

1. The supplies, tools and materials such as sawdust, wood, wire, plywood, cheap board, and glue were used in the construction of the EARIST eight Colleges logo made of sawdust

2. The sketches/drawings were used as the basis of construction of the school logo made of sawdust. It illustrates the correct diameter, height, mass, volume and form.

3. Revisions and adjustments were made to ensure stability, its character and artistic value

.

V. Conclusions:

From the findings of the study, the following conclusions are drawn:

1. A school logo can be constructed using sawdust

2. A drawing is important in constructing the EARIST Colleges logo (8 logos) to obtain accurate shape, form and size of back part and of the whole.

3. The EARIST Colleges logo (8 logos) have undergone revisions and adjustments ensure balance and stability

4. The EARIST Colleges logo (8 logos) have been used and displayed in the office of the different college's office.

Documentation:

EARIST Logo base and armature

Finished EARIST Logo

MODULAR INSTRUCTIONAL MATERIALS IN FOOD AND BEVERAGE SERVICES: ITS ACCEPTABILITY

Renz Robert E. Salvador

Introduction

Food & Beverage Services subject is one of the subject in Hotel & Restaurant Management curriculum which can be considered as the most difficult to take because a student cannot pass the subject without acquiring first the skills and mastering the knowledge on Food & Beverage Services operation. What makes it harder is the absence of an instructional material such as module that will help the students in classroom discussion and actual application of skills. It is for the same reason that, the students are having difficulty in doing the laboratory activities or exercises because they do not have the aid of an instructional material such as module to guide them. Researcher's believed that the success of learning of the students do not only depend on the instructor / professor but also lies on his strategies or methodologies used in conducting classes. One of the professional responsibilities of the instructor or professor is to help the students acquire a broader and deeper insight into the fundamental concepts of learning.

Teaching materials are the resources a teacher uses to deliver instruction. Each teacher requires a range of tools to draw upon in order to assist and support student learning. These materials play a large role in making knowledge accessible to a learner and can encourage a student to engage with knowledge in different ways. (Hidalgo, 2009)

Instructional materials role on the student is to hasten information into learners mind as what is seen is understood more than what is heard. During the formative years, learners add increasing qualities of knowledge to what is already learn through exploration as they grow and expand the horizon on the quality of concepts mastered. To widen mastery of concepts, rich learning environment which is filled with a variety of instructional materials tends to foster the faster acquisition of requisite skills for sustained learning development (Kumari, 2008).

Module is an instructional package dealing with a single conceptual unit of subject-matter. Modules are designed to help the students accomplish certain well-defined objectives. With the use of a module, instruction can be individualized. The learners can go through the material at their own pace and at their own time. They may also be used to complement instruction. Modules allow the learners to go through the material at their own pace. They may be used for self-instruction or to complement instruction. Knowing how to write learning material in module format is an important skill that trainers should develop (Salandan, 2010).

Hence, the researcher adopted the Modular Instructional Material in Food and Beverage Service in order to respond to the needs and challenges in the global market. This is a student-learning centred approved. Students as lifelong learners need to be abreast with the trends with onset of globalization in the hospitality industry, thus this will make them become more competitive which will serve as the avenue for greater opportunity in the field of work.

The researcher wanted to produce a Modular Instructional Material to help lessen the insufficiency of learning materials. The Modular Instructional Materials in Food and Beverage Services will cater the needs of the Bachelor of Technology and Livelihood Education student for further learning on supervisory level in the teaching academe. These would eventually help the students to attain the skills and knowledge resulting to competitiveness and greater opportunities of employment in the educational market.

The researcher wanted to produce a Modular Instructional Material to help lessen the insufficiency of learning materials. The Modular Instructional Materials in Food and Beverage Services will cater the needs of the Hotel and Restaurant Management student for further learning on supervisory level in the Hospitality Industry. These would eventually help the students to attain the skills and knowledge resulting to competitiveness and greater opportunities of employment in the global market.

Statement of the Problem

The study attempted to assess the Modular Instructional Material in Food and Beverage Services: Its Acceptability.

Specifically, this study sought to answer the sub problems:

1. What is the extent of utilization of Instructional Material in teaching Food and Beverage Services?

2. Based on the finding, what instructional material may be developed?

3. How acceptable is the proposed Modular Instructional Material in Food and Beverage Services as assessed by the Administrators, Faculty and TESDA Assessors in terms of:
    1. Objectives;
    2. Contents;
    3. Organization;
    4. Language & Style;
    5. Usefulness;
    6. Activities; and
    7. Evaluation?

4. Is there a significant difference in the assessment of the three groups of respondents on the above mentioned variables?

5. How do the students performed in the pre-test and post-test after using the Modular Instructional Material in Food and Beverage Services? Is there a significant difference?

Research Design

The study utilized the descriptive-correlational approach research designs. Descriptive method is the most appropriate for this research. This method is concerned with the prevailing or existing status of an event or problem under observation. The descriptive method is used in the literal sense of describing situations or events. It is the accumulation of the database that is solely descriptive but may also aim for more powerful purpose like to seek or explain relationships and test hypotheses. The study focused on the acceptability of Modular Instructional Material of Food and Beverage Service. Best and Khan (2006), a descriptive study “describes and interprets what is”.

This was used to evaluate the acceptability of the Modular Instructional Material in Food and Beverage Services.

Research Locale

The study was conducted by the College of Arts & Sciences from the different campuses in Pasig, Taytay, Rodriguez and Marikina. The TESDA Assessor from the PaMaMariSan District at NTTC Marikina City.

Respondents of the study

The respondents of the study were school administrators, faculty members teaching food and beverage services, and TESDA Assessor.

Sampling Procedure

Purposive sampling was used in selecting the respondents in the conduct of this study because the target respondents were the School Administrators, faculty and TESDA Assessors. A purposive sampling technique was used in the study because it is a technique where the researcher selects his respondents on the basis of defined criteria so that data can be elicited.

The main criterion for selecting any unit from the population using this sampling procedure is the investigator's judgment that the unit somehow represents the population. Often units for this type of sample are selected on the basis of known characteristics that seem to represent the population. This study assumes that the units selected represent the population on unknown characteristics as well as the respondents of the study; age, gender, educational attainment, & civic status. (Bernabe, 2011)

There were three groups of respondents. The respondents of the study were school Administrators (27), Faculty Members (50) and TESDA Assessors (35) of Food & Beverage Services. The pre-tests and post-tests consisted of 100 items wwe answered by selected (80) students of Bachelor of Science in Hotel and Restaurant Management (BSHRM) of College of Arts & Sciences of Asia & the Pacific who are taking up the Food and Beverage Services subject during the First Semester of academic year 2016-2017.

Research Instrument

The study utilized the survey questionnaire as instrument in gathering the needed data and information.

Survey Questionnaire

The survey questionnaire was the primary instrument in gathering data for the acceptability of Outcomes-Based syllabus and instructional material in Food and Beverage Services. The researcher-made survey-questionnaire was divided into three parts.

Part I Demographic profile of the Respondents which included the gender, age, civil status, and educational attainment.

Part II Assessment on the proposed Modular Instructional syllabus in Food and Beverage Services.

Part III Acceptability of the modular instructional material in Food and Beverage Services.

Statistical Tools Used

The study used the following statistical tool:

1. **Percentage**. This was used to get the frequency of each value or class interval express as a percentage of the total number of observations derived by multiplying each of the relative frequency values by 100.

2. **Weighted mean**. This was used in the computation of acceptability of the respondents to the proposed syllabus and modular instructional material in Food and Beverage Services.

3. **Mean Percentage Score**. This was used to determine the performance level of the students in the pre-test and post-test.

4. **t-test for Dependent samples**. The t-test was used to compare the assessments of the administrators, faculty and TESDA Assessors on the proposed Modular Instructional Material in Food and Beverage Services.

5. **Analysis of Variance (ANOVA)**. This was utilized to compare the assessments of the three groups of respondents on the developed Modular Instructional Material in Food and Beverage Services.

Summary of Findings and Conclusions

The salient findings of the study are as follows:

1. On the extent of utilization of instructional material in teaching Food and Beverages Services.

The extent of utilization of instructional material in teaching Food and Beverages as assessed by administrators rated as utilized with a composite weighted mean of 3.49 and on verbal interpretation of **utilized**. One item was rated as **highly utilized**, this was, magazine as supported by the weighted mean of 4.33. Four (4) items were rated as **utilized**, namely; books, journals with a weighted means of 4.04, manuals with a weighted mean of 3.96 and modules with a weighted mean of 3.67. Three (3) items were rated as **moderately utilized**, namely; overhead projector/LCD with a weighted mean of 3.22, VCD/DVD's/Cd's with a weighted mean of 3.00 and compilation of lessons with a weighted mean of 2.85. One item was rated **least utilized**, this was; computer-based instructional materials with a weighted mean of 2.33.

2. On the proposed instructional material.

Based on the findings on the extent of utilization of modular instructional materials, an instructional material on Food and Beverage Services could be designed and developed to help the students enhance their knowledge and skills.

It was found out that there is a need to develop an instructional materials which highly demanded in the teaching Food and Beverages which is significant in order to improve the performance level of the students in mastering the learning competencies and meet the performance standard in Food and Beverages subject.

3. On the assessment of the respondents on the developed Modular Instructional Materials in Food and Beverage Services.

The proposed Modular Instructional Material as assessed by respondents in terms of objectives rated as **highly acceptable** with overall composite weighted mean of 4.24. Three (3) items were rated as **highly acceptable**, namely; the objectives are clearly stated with composite weighted means of 4.34, the objectives are related to the content with a weighted mean of 4.25 and express in language that is easy to understand with a weighted mean of 4.24. Two (2) items were rated as **acceptable**, namely; provides direction to learners and to the learning area with composite weighted mean of 4.19 and specific, measurable achievements and time bound.

4. On the comparison of the assessment of the respondents.

The proposed Modular Instructional Material as assessed by respondents in terms of organization rated as **highly acceptable** with overall composite weighted mean of 4.31. All items were rated as **highly acceptable**, namely; topics are properly sequenced with composite weighted mean of 4.36, the activities to be performed are easy to follow with composite weighted mean of 4.33, the directions are clearly stated, there is a smooth flow of presentation within the presentation with weighted means of 4.31, presentations of the information are interesting and encourage a high degree of student's involvement with composite weighted mean of 4.30 and directions are easy to follow even without the help of the teachers with composite weighted mean of 4.26.

5. On the performance of the students in their pre-test and post-test after using the Modular Instructional Materials in Food and Beverage Services.

The data shows that the performance as indicated in the mean scores of the respondents before exposure on the said modular instructional material in teaching Food and Beverages Services was **36.78** out of 100-item test with a **36.78% mean performance score** and a verbal interpretation of **average mastery**. After the exposure on the developed modular instructional material, the performance of the student increases to **70.50** and obtained a **mean performance score of 70.50%** with a verbal interpretation of **moving towards mastery**.

Conclusions

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

1. Faculty members utilized different mode of instructional materials like books, magazines, manuals, books, journals and moderately utilized overhead projector/LCD, compilation of lesson and modular instructional material.

2. The Modular Instructional Material was designed and developed to address the scarcity of the technology driven instructional material to master the intended competencies in teaching Food and Beverages Services and serve as a guide to enhance lessons.

3. The proposed Modular Instructional Material in teaching Food and Beverages Services was highly acceptable as to objectives, organization, language and style and activities while acceptable as to content, usefulness, navigation and evaluation.

4. The assessment of the administrators, faculty teachers and TESDA assessors with respect to the objectives, content, organization, language and style, usefulness, navigation, activities, and evaluation on the developed modular instructional material in teaching Food and Beverages Services were comparable and coherent.

5. Significant difference exists on the performance of the students after using the developed Modular Instructional Material in teaching Food and Beverages Services. The students performed better in post-test increasing their performance from moving to average mastery to moving toward mastery.

Recommendations

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

1. The management of College of Arts & Sciences of Asia & the Pacific may consider using the proposed Modular Instructional Material in teaching Food and Beverages Services

2. The developed Modular Instructional Material may be used for Hospitality Management Students and may be adopted not only on BSHRM but also in other related courses.

3. Encourage teacher to integrate modular instructional material in teaching Food and Beverages Services.

4. Provide logistic and moral support to those capable teachers in developing modular instructional material or technology-based instructional material.

5. Incentives system may be considered by the administration to those teachers who engage themselves in improving instructional delivery by designing and developing different types of instructional materials.

REFERENCES

Agno Lydia N. (2010). *Principles of teaching 1: A modular approach.* 1st Edition. Quezon City, Philippines: C & E Publishing, Inc.

Bernardez, B.E. (2011) *Methodology of research and thesis writing,* Jimczyville Publication, Malabon City.

Calderon J & Gonzalez, E. (2012). *Methods of research & thesis writing.* National Bookstore. Mandaluyong City.

Goodman, J. (2012). *Improving progress through AfL*. Dr. Joanna Goodman reflects on the role and application of Assessment for Learning. SecEd, 304:13.

Gines, A.C. (2010). *Educational psychology: A textbook for college students in psychology and teacher education*. Manila: Rex Bookstore.

Hidalgo, F.S.J. (2009). *For the Filipino Teacher: Tips on how to teach effectively*. Manila: Rex Bookstore.

Kumari, C.J. & Rao, R.B (2008). *Materials of teaching educational technology*. New Delhi, India: Discovery Publishing House.

Murranka, P.A. and Lynch D. (2003). *Developing a competency- based fundamentals of management communication course*.

Navaro R. L. (2011) *Research based teaching and learning*. Loremar Publishing Inc. Quezon City, Philippines

Salandanan, G. (2010). *Elements of good teaching*. Philippines: Lorimar Publishing.

Salmorin, M and Achaas L. (2014) *Methods of research*. Mindshapers Co. Inc. Manila

Westwood, P. (2008) *What teachers need to know about teaching methods.* Camberwell, Victoria: ACER Press, Australia

B. Journal Articles

Aguba, A. (2015). *"5 Ways to improve hospitality education in the Philippines"*. Hospitality News Philippines, March 25, 2015. Retrieved from: http://hospitalitynews.ph/1051/5-ways-to-improve-hospitality-education-in-the-philippines/

Allen, K.E. and Hart ,B. (2010). *The early years arrangement for learning*. Pretence Hall N.J.

Linde, Beverly; Jeffries, Pamela R.; Woolf, Shirley;(2013) *Technology - based vs. traditional instruction:* A Comparison of Two Methods for TEACHING the Skill of Performing a 12-Lead ECG. March/April 2013 - Volume 24 - Issue 2 - pp 70-74.

Kember, D., Ho, A. and Hong, C. (2008). *The importance of establishing relevance in motivating student learning.* Active Learning in Higher Education 9:24-263. Retrieved from: http://alh.sagepub.com/content/9/3/249.abstarct.

Nwike, Matthew C. and Onyejegbu Catherine. (2013). *Effects of Use of Instructional Materials on Students Cognitive Achievement in Agricultural Science*. Journal of Educational and Social Research http://webcache.googleusercontent.com/search?q=cache:qKrxymKAevsJ:www.mcser.org/journal/index.php/jesr/article/view/645+&cd=1&hl=en&ct=clnk&gl=ph

Tominez, Bonimar A., Leila M. Dela Cruz, and Bryan B. Gabatino.(2013) U*sage of instructional materials among teacher education faculty in Nueva Vizcaya, Philippines*. Retrieved from: http://ejournals.ph/issue.php?id=303.

C. Thesis & Dissertation

Alejo, M.(2013) *Instructional Module in Tour Guiding: It's Acceptability.* (Master's Thesis) Eulogio "Amang" Rodriguez Institute of Technology Manila, Graduate School. Manila.

Alterado (2014) *Outcomes-Based Syllabus and Modules in Western Cuisine: It's Acceptability.* Master's Thesis) Eulogio "Amang" Rodriguez Institute of Technology Manila, Graduate School. Manila

Banzuelo, L. (2013) *Competency-Based Module in Asian Cuisine: It's Acceptability.* Master's Thesis) Eulogio "Amang" Rodriguez Institute of Technology Manila, Graduate School. Manila

Dinaga M. R.(2013) *Modular Instructional Material in Culinary Arts: It's Acceptability*. (Master's Thesis) Eulogio "Amang" Rodriguez Institute of Technology Manila, Graduate School. Manila.

Marcelo C. (2014) *Modular Instructional Material in International Cuisine: It's Acceptability.* (Master's Thesis) Eulogio "Amang" Rodriguez Institute of Technology Manila, Graduate School. Manila

Samuel M. 2011. *South African teacher voices*: recurring resistances and reconstructions for teacher education and development, Journal of Education for Teaching: International research and pedagogy, 40:5, 610-621.

Tangonan M. (2011) *Innovative Instructional Material in Baking: It's Acceptability.* (Master's Thesis) Eulogio "Amang" Rodriguez Institute of Technology Manila, Graduate School. Manila

Travers, J. F., Elliott, S. N., & Kratochwill, T. R. (2015). *Educational psychology: Effective teaching, effective learning.* Madison, Wis: Brown & Benchmark.

D. Online Sources

Ali Riasat, Safdar Rehman Ghazi, Muhammad Saeed Khan, Shukat Hussain, Zakia Tanzeela Faitma. (2010). *Effectiveness of Modular Teaching in Biology at Secondary Level.* http://www.ccsenet.org/journal/index.php/ass/article/view/7263

Amonceda, Angelina D. "Modular Instruction" Notre Dame University of Alarbel, South Cotabato.
http://www.iiste.org/Journals/index.php/JEP/article/viewFile/7385/7520

Asogwa VC (2013). *Introduction to wildlife and fisheries.* Lecture note, Department of Agricultural Education, University of Agriculture, Makurdi. Availability and utilization of instructional materials for effective teaching of fish production to students in senior secondary schools in Benue State, Nigeria. Vol. 8(49), pp. 6601-6607, 19 December, 2013.
http://www.academicjournals.org/journal/AJAR/article-full-text-pdf/7F504E642374

Barbosa, E. F.; Maldonado, J. C. *Collaborative development of educational modules:* a need for lifelong learning. In: G. D. Magoulas. (Org.). E-Infrastructures and Technologies for Lifelong Learning: Next Generation Environments. : IGI Global, 2011, v. , p. 175-211.
http://cienciaparaeducacao.org/eng/publicacao/barbosa-e-f-maldonado-j-c-collaborative-development-of-educational-modules-a-need-for-lifelong-learning-in-g-d-magoulas-org-e-infrastructures-and-technologies-for-lifelong-learning/

Barker Denjuami. (2013) *Authoritarian vs Non-authoritarian Teaching Philosophies.* https://prezi.com/verh_ftrmi8m/authoritarian-vs-non-authoritarian-teaching-philosophies/

Best, J.W. and Kahn J.V. (2006) *Research in Education.* 8th Edition.A Viacom Company, 160 Gould St. Needham Heights, MA. USA.
http://webcache.googleusercontent.com/search?q=cache:Tgoo_XX8NZ8J:www.odu.edu/~jritz/attachments/reined.pdf+&cd=1&hl=en&ct=clnk&gl=ph

Birisci, S., and Metin, M. (2010) *Developing an Instructional Material using a concept cartoon adapted to the 5E model:* A Sample of teaching erosion. Asia-Pacific Forum on Science Learning and Teaching, 11 (1), 1, Article 19.
https://books.google.com.ph/books?id=07JnCgAAQBAJ&pg=PA78&lpg=PA78&dq=birisci+and+metin+on+instructional+materials&source=bl&ots=mHGSKfRve2&sig=dECHtcaZiSuCjobA2Lbz4DFzvTE&hl=en&sa=X&ved=0ahUKEwjPazPuMnSAhVnlVQKHdOXAWEQ6AEIIzAB#v=onepage&q=birisci%20and%20metin%20on%20instructional%20materials&f=false

Edenfield, K. W. (2010). *Mathematics Teachers' Use of Instructional Materials while Implementing a New Curriculum.* A Dissertation Submitted to the Graduate Faculty of The University of Georgia. Athens Georgia
https://webcache.googleusercontent.com/search?q=cache:5MBFfKpB1DwJ:https://getd.libs.uga.edu/pdfs/edenfield_kelly_w_201005_phd.pdf+&cd=1&hl=en&ct=clnk&gl=ph

Harvey, Amelia P. *Common Core and Textbooks: Out of Alignment?* AMELIA PAK-HARVEY OF THE LOWELL SUN FOR Education Writers Association. JUNE 16, 2015.
http://www.ewa.org/blog-educated-reporter/common-core-and-textbooks-out-alignment

Lixun Wang.(2011) *Designing and Implementing Outcome-Based Learning in a Linguistics Course: a Case Study in Hong Kong.*
http://www.sciencedirect.com/science/article/pii/S1877042811000942

Merriam-Webster Online
https://www.merriam-webster.com/dictionary/objective

Mopera, Marites A. (2011) *Science Based Modular Work text for Enhancing Grammar Learning of First Year High School Students in the Science High School*. Southern Luzon State University, Philippines.
http://webcache.googleusercontent.com/search?q=cache:4WY1s4w_JnEJ:ictl.intimal.edu.my/ictl2011/proceedings/Parallel%2520Sessions%25205/5B/5B03P165.docx+&cd=1&hl=en&ct=clnk&gl=ph

Northern Illinois University (2015) *"Blackboard Learning Modules "*. Retrieved from:
http://www.niu.edu/blackboard/guides/learning_modules.pdf

Okobia, E. O. (2011). *Availability and Teachers' Use of Instructional Materials and Resources in the Implementation of Social Studies in Junior Secondary Schools in Edo State*, Nigeria. Review of European Studies,3(2), 90-97.
http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.926.8652&rep=rep1&type=pdf

Syatriana Eny, Djamiah Husain, Haryanto ., Baso Jabu (2013) *A Model of Creating Instructional Materials Based on the School Curriculum for Indonesian Secondary Schools*
http://www.iiste.org/Journals/index.php/JEP/article/view/7893

UF e-Learning Help (2013). *Learning Modules*. Retrieved from: https://lss.at.ufl.edu/help/Learning_Modules

University of Southern Carolina (2015). *About Learning Modules.* Retrieved from: https://blackboardhelp.usc.edu/course-content/adding-content-and-resources/learning-modules/

Sandoval, Lorela U. *Outcomes-based education: A shift of faith*.Hospitality News Philippines, August 8, 2015. Retrieved from: http://hospitalitynews.ph/1363/outcomes-based-education-a-shift-of-faith/

Syracuse University (2016) *Building Learning Modules.* Retrieved from: https://answers.syr.edu/display/blackboard01/Building+Learning+Modules

ON PROPOSED BOARD GAME: ROOK DAMATH

Larex B. Tagalog
Jefferson F. Asendente, Jean A. Bigcas, and Josilito B. Daligdig

INTRODUCTION

Rook Theory was first introduced by Kaplansky and Riordan in the 1940's as a framework for studying permutations with restricted positions, and has been studied subsequently by many authors. In a chess game a rook can take any square in its corresponding row or column of the 8 × 8 chessboard to attack an opposing piece. Thus, one can envision a permutation as a placement of n rooks on a $n \times n$ chessboard such that no two rooks has the ability to attack one another. The concept of rook numbers and hit numbers were developed, with the k -th hit number counting the number of ways that n non-attacking rooks can be placed on an $n \times n$ chessboard such that k of those rooks were placed on a certain predefined subset of squares on that board. In the 1990's, mathematicians became enthusiastic in developing the Rook Theory, both for its own intrinsic appeal and for using it as a tool to prove theorems from other areas of enumerative combinatorics. Rook Theory is 2 widely used by mathematicians like, Garsia, Remmel, Haglund, Dworkinand other mathematicians in studying the concepts of graphs, hypergeometric series, Stirling numbers and permutations, Bessel polynomials, Abel polynomials and forest, among other combinatorial objects.

STATEMENT OF THE PROBLEM/OBJECTIVES

The study aimed to invent a game based on Rook Theory and with relation to Damath. Furthermore, this was also to investigate the nature and properties of Rook Theory to give illustrations and create a clear understanding of the concepts of classical Rook Theory including the rook numbers and the hit numbers, to explore the properties of rook polynomials and its relation to the concept of classical Rook Theory, to investigate its significant applications and create concrete ideas regarding the core of the study.

SIGNIFICANCE OF THE STUDY

The study of rook polynomials from the concept rook theory can be a learning instrument for mathematics enthusiast. As this study possessed several interesting 3 properties, the subject of the study revealed significant relation in other areas of mathematics. The subject of the study can be used to understand concepts from different field of Mathematics. The study also showed resourcefulness among early mathematicians, a simple board game became an instrument in explaining an abstract concept in Mathematics. Such example can be used to motivate students in creating a unique way of conducting research in different areas of Mathematics.

The output of the study would serve as a reference and source of information to future researchers who are interested on resuming the exploration on the subject of the study.

METHODOLOGY

This study used the descriptive method of research in presenting the formulated ideas related to the subject of the study. It investigated the nature of different properties underlying inside the core of the study. This form of research collected data to test the validity of the hypothesis or enumerate answers to questions regarding the current situation of the subject of the study. The study also utilized expository method of research since it is used to explain, describe, and give information to educate the readers. Researchers focused on investigating the published theorems, definitions and properties related to the concept of Rook Theory. This paper provided review of basic related concepts and some definitions obtained from journals and encyclopedia. The researchers also used the aid of published journals from skilled authors, and visited some school libraries for additional source of information and references.

RESULTS AND DISCUSSION

1. Rook Damath Rook Damath was similar to the traditional game Damath. The difference was Rook Damath use chips that corresponds to a rook placement on board . The game computes the number 55 of ways of placing rk rooks on an $n \times n$ board denoted by . And performing the four basic operation (Addition, Subtraction, Multiplication and Division) on the computed values to determine the score. The game used several theorems found in the study of Rook Theory which was used in determining the scores and values needed while playing the game. The board in Rook Damath is quite similar to those of traditional Damath boards but there are significant differences identified.

2. The Board of Rook Damath was very similar to the board of traditional Damath. However, the color of the squares of the board is inverted. While Damath board even squares is white and the odd is black, Rook Damath boards even squares is black and odd squares is white.

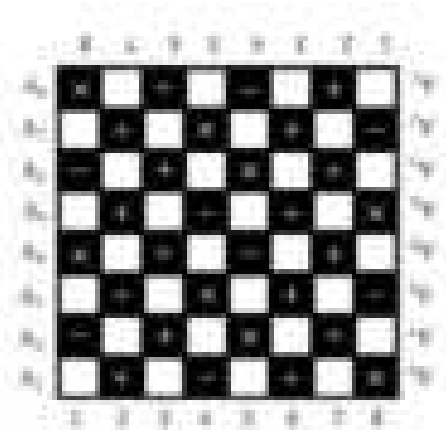


Figure 1: Rook Damath Board

Moreover, the horizontal side is labeled from 1 to 8 which corresponds to k which is needed by special chips on Rook Damath. The vertical side is labeled with $A1$ up to $A8$ which corresponds to an $n \times n$ board. This values is considered when taking a chips.

Chips

The chips of the Rook Damath are consisted of 12 chips per player. Each chips corresponds to the number of k nonattacking rooks on an $n \times n$ chessboard. The chips of the Rook Damath consisted of rook numbers $r0$, $r1$,2, $r3$, $r4$, $r5$, rk, $rk+1$, and $rk-1$.

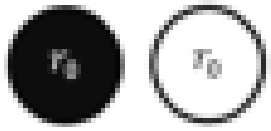


Figure 2: r_0

The chips $r0$ corresponds to no rook to be arranged on an $n \times n$ board. Its value is always equal to 1 no matter what is the size of the given board.

Figure 3: r_1

The chips $r1$ corresponds to one rook to be arranged on an $n \times n$ board denoted by. The value of $r1$ is equal to the $r0$ $r0$ 1 $r1$ number of squares contained on board An. Hence computing the value of 1 on an $n \times n$ board is equal to $n2$.

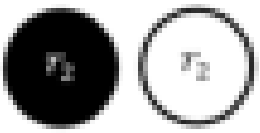


Figure 4: r_2

The chips $r2$ correspond to two rooks to be arranged on an $n \times n$ board denoted by An.

Figure 5: r_3

The chips $r3$ correspond to three rooks to be arranged on an $n \times n$ board denoted by. It is one of the most crucial chips of the game since it has the capability to give the player a very high score when taking boards An where $n > 3$.

Figure 6: r_4

The chips $r4$ correspond to four rooks to be arranged on an $n \times n$ board denoted by. Similar to $r3$, $r4$ is also one of the most crucial chips of the game since it has the $r2$ capability to give the player a very high score when taking boards An where $n > 4$.

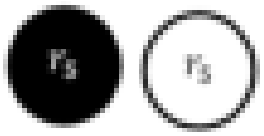


Figure 7: r_5

The chips $r5$ correspond to five rooks to be arranged on an $n \times n$ board denoted by. Usually gives the player a value of zero when placed on boards $A1$, 2, $A3$, $A4$ since placing 5 rooks on an $n \times n$ board where $n < 5$ is not possible.

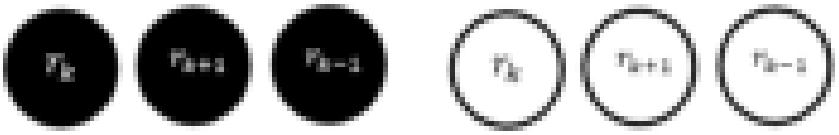


Figure 8: r_k, r_{k+1}, r_{k-1}

Special chips are the pieces that change its value depending on its position on the board. The value of k depends on their position on the Rook damath board. The chips, rk+1, and rk−1 are the special chips of the game.

3. Rules on Rook Damath Board Game

3.1 Set the starting position of the chips.

3.2 Toss a coin to determine which player will have the first 'move'.

3.3 Moving a chip means sliding it diagonally in the forward direction only except when taking an opponent's chip or if a 'dama' chip takes an opponent's chip.

3.4 The two players alternately take turns in moving a chip (pass is not allowed).

3.5. A player who touches a chip ('touch move') is required to move unless it is not possible to do so. After each 'move', a player has to record his or her 'move' in a score sheet (only one score sheet will be used by the two players).

3.6. In as much as taking a chip or chips is mandatory. In taking an opponent's chip, the 'taker' chip jumps over the 'taken' chip and uses any of the four operation symbols of +, -, x, and -:- where the taker chip lands.

3.7. A chip is declared 'dama' if it stops in any of the following squares of the opposing player: (1,$A1$) (3,$A2$) (5,$A3$) (7,$A4$) Similarly, the opposing player's chip is declared 'dama' if it stops in any of the following squares: (2,$A1$) (4,$A2$) (6,$A3$) (8,$A4$) .

3.8. A 'dama' chip can slide diagonally forward or backward in any unoccupied square as long as no opponent's chip blocks its path. It could take a chip or chips whereby its corresponding sum, difference, product or quotient is doubled. Similarly, if an ordinary chip takes an opponent's 'dama' chip, its score is also doubled.

3.9. Correspondingly, if a 'dama' chip takes an opponent's 'dama' chip, then its score is quadrupled.

3.10. A 'taker' chip can take one chip or more than one chips with the required option to take the greater number of chips.

3.11. Between "a 'dama' chip taking an opponent's chip" and "a chip taking an opponent's chip", the former prevails. · A 'taker' or 'taken dama' chip should be identified by encircling it in the scoresheet.

3.12. The game ends if: the moves are repetitive; · a player has no more chips to move; · an opponent's chip is 'cornered'.

4. Scoring and Computations

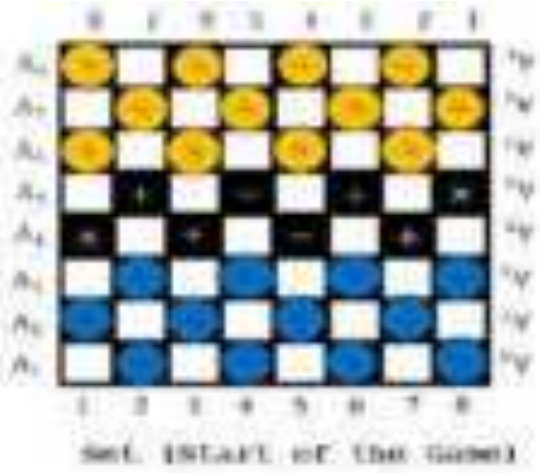
Each piece of Rook Damath corresponds to the number of k-nonattacking rooks on an An, an $n \times n$ board. Once a piece of an opposing side is captured, the operation on the square of the attacking piece is considered. The value of also depends on the position of the attacking piece. Once the value of and (for special chips)IA determined the value of the attacking piece and the eaten piece is computed as follows.

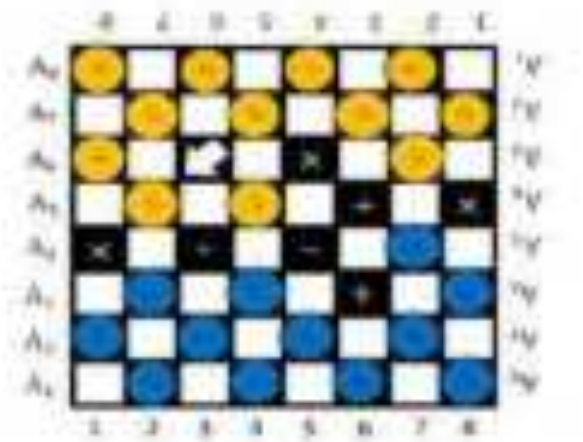
$$(n, k)P(n, k)$$

where n is the size of the board and k is the number of rooks to be placed (rk). Once the values of the attacking piece and the eaten piece is computed the indicated operation is performed on the values of the piece. The value of the attacking piece always comes first on the equation. The winner of the game is the player who acquired the highest positive score on the game.

Example of Game with Scores

Player 1 played with light colored chips and Player 2 played with dark colored chips.





Operation: None

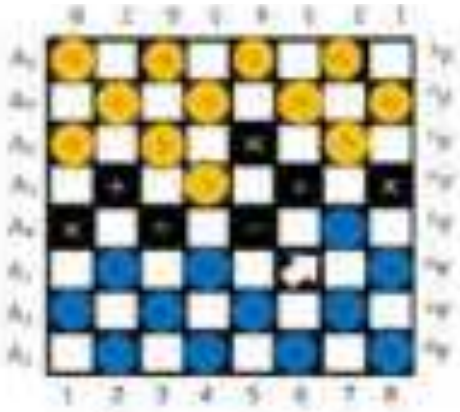
Move Score: None

Player 1:

None

Player 2:

None



Operation: None

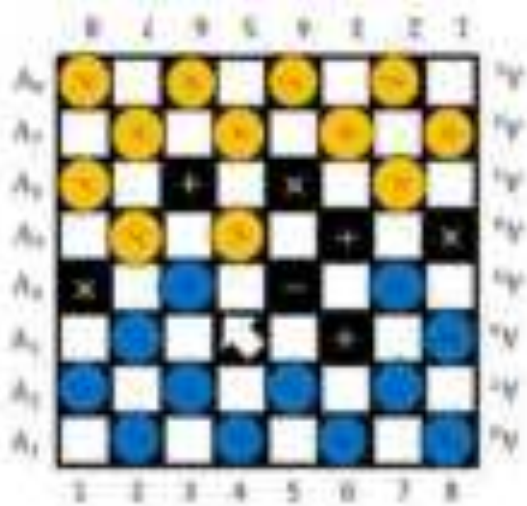
Move Score: None

Player 1:

None

Player 2:

None



Operation: None

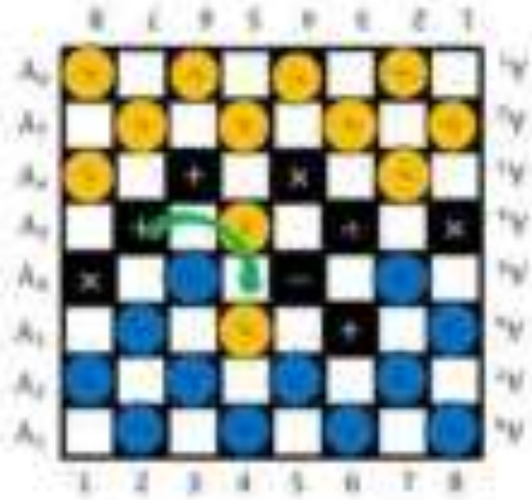
Move Score: None

Player 1:

None

Player 2:

None



Move: $r_2 \times r_1$ at $(7, A_6)$

Operation:

Multiplication

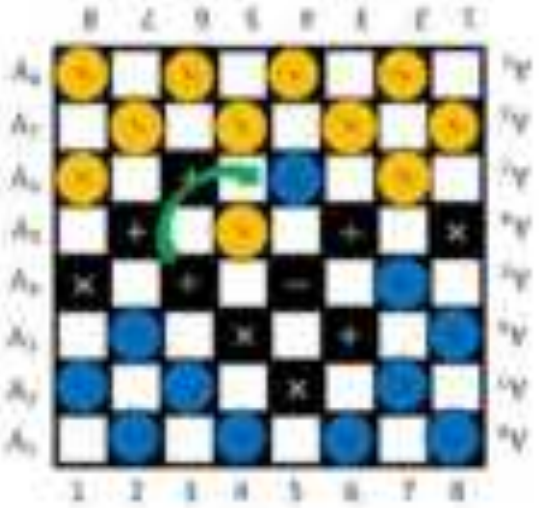
Move Score: 16,200

Player 1:

16,200

Player 2:

None



Move: $r_4 \times r_1$ at $(5, A_6)$

Operation:

Multiplication

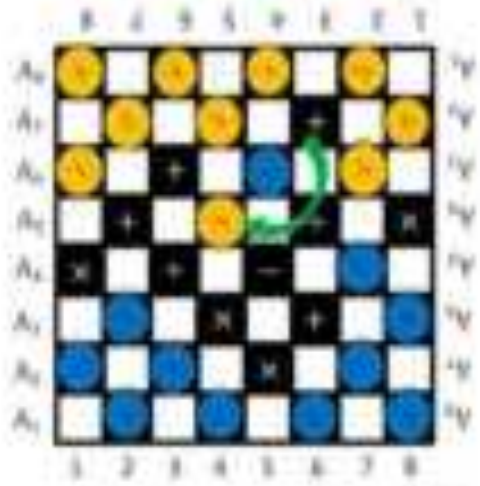
Move Score: 194,000

Player 1:

16,200

Player 2:

194,400.33



Operation:

Subtraction

Move Score: -72

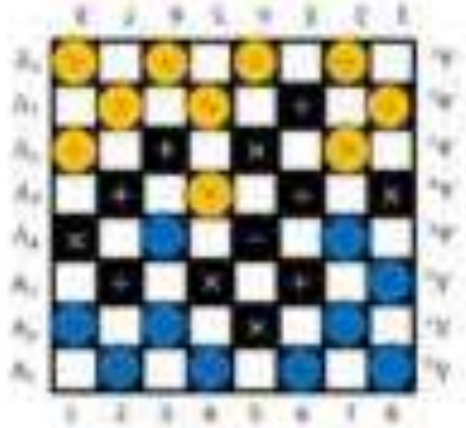
Player 1:

16,128

Player 2:

134,400.33

Move: $r_1 - r_4$ at $(5, A_4)$



Operation:

Multiplication

Move Score: None

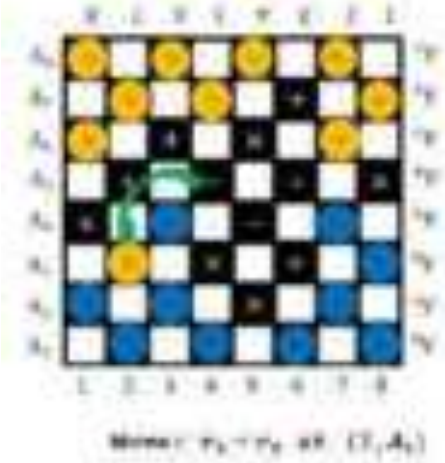
Player 1:

16,128

Player 2:

134,400.33

Move: r_3 to $(5, A_4)$



Operation:

Division

Move Score: 2

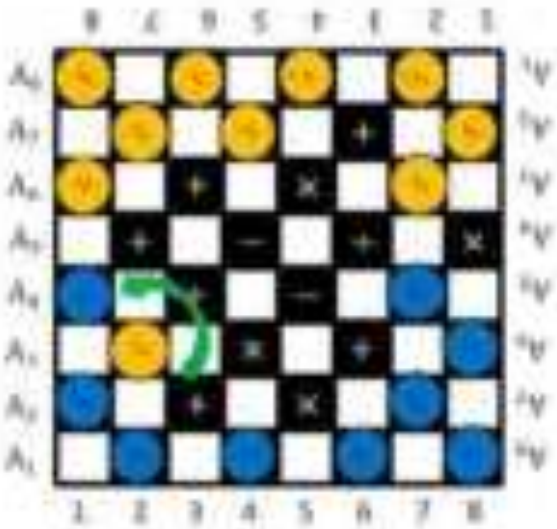
Player 1:

16,128

Player 2:

134,400.33

Move: $r_4 - r_3$ at $(7, A_1)$



Move: $r_3 \times r_3$ at $(1, A_4)$

Operation:

Multiplication

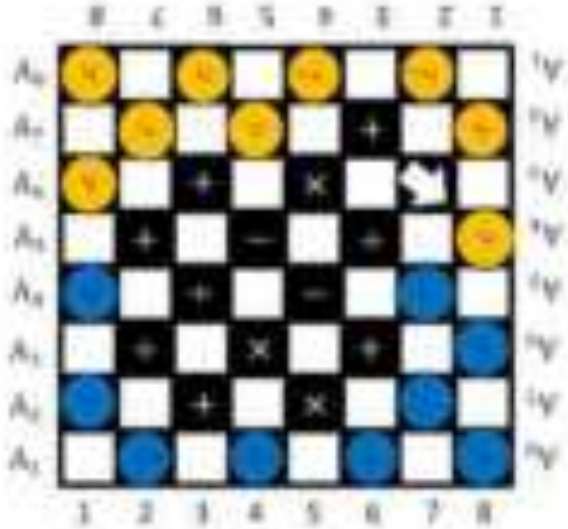
Move Score: 9,216

Player 1:

16,129

Player 2:

203,616.33



Move: r_3 to $(2, A_4)$

Operation:

None

Move Score: None

Player 1:

16,129

Player 2:

203,616.33

CONCLUSIONS

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

1. Rook Number is the core concept of Rook Theory.

2. Rook polynomials were used to count the number of ways of winning a lottery, winning a gamble and assignment problems.

3. The Rook Damath was invented by utilizing the concept of Rook Theory and some game rules in the Damath

4. Scoring in Rook Damath can be obtained by rules in counting technique such as permutation.

RECOMMENDATIONS

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

1. Further study of classical Rook Theory on higher dimensions.

2. Research and exploration of graphical representation of rook permutations contained on the given board.

3. Exploration of other properties of Rook Theory on specialized Ferrers board.

4. The Rook Damath may be used as recreational game to math classes or math activities.

REFERENCES

Journals

Butler F., Haglund J., Remmel J.B. (1991), Notes on Rook Polynomial, University of Pennsylvania, Philadelphia.

Cain, Daniel E. (2003),Rook Theory and Matchings, University of Pennsylvania.

Gessel, Ira M. (2013),Rook polynomials, University of Washington Combinatorics Seminar.

Haglund J., Remmel J.B. (2001), Rook Theory for Perfect Matching, Department of Mathematics, University of California, California.

Lockwood, Elise (2006), Rook ‘emDanno, Portland State University, Department of Mathematics and Statistics, Spring.

Loehr, and Remmel(2009), Rook-by-rook rook theory: Bijective proofs of rook and hit equivalences, Advances in Applied Mathematics 42

Zindle, Benjamin (2007), Rook polynomial for chessboards of two and three dimensions, R ocheter Institute of Technology, Rochester,

APPENDIX

Symbols and notation

x	value of x
$\subseteq$	subset of the board
Σ	summation
P_n	permutation
A_n	an $n \times n$ board
$A_{m,n}$	an $m \times n$ board
$B \subseteq A_n$	a generalized board subset of A_n
r_k	number of rooks
$r_k(B)$	number ways to arrange nonattacking rooks on the given board.
$R(x,B)$	rook polynomial of the given board

DEVELOPMENT OF A DISASTER MANAGEMENT ALERT SYSTEM THROUGH THE USE OF FIELD PROGRAMMABLE GATE ARRAYS

Ador G. Utulo
Bernard C. Fabro

INTRODUCTION

The effects of natural disasters and calamities are getting more severe nowadays. Natural occurrences such as typhoons or heavy rainfall, fire and earthquake results an immediate impact in the community. Sampaloc District, Manila, consisting 241 barangays, is one high-risk area in the City of Manila that is flood-prone during wet season and fire-prone during dry season. The threat of the "Big One", an anticipated 7.2 magnitude earthquake is also a major consideration nowadays in disaster risk reduction management. The devastation caused by the past typhoons (Ondoy) and monsoon rains (Habagat), earthquake and fire have made the public more aware of the effects of these disasters that real-time updates while it happen is now a primary concern.

The impact of these disasters immediately affects the transportation, commerce or livelihood and education in the area. Loss of lives and damage to properties leave a much greater impact to individuals during disasters. For developing countries, the economic growth is at risk whenever a disaster occurs.

In the efforts of the national government to address the problems in disaster management, several projects had been undertaken which includes a comprehensive study on urban planning and development and the systematic hazard mapping and monitoring. Government agencies, such as Department of Public Works and Highways, Metro Manila Development Authority, Department of Science and Technology, Philvocs and National Disaster Risk Reduction Management Council (formerly National Disaster Coordinating Council), have developed and restructured their own plans in disaster management. Multimillion projects were implemented by these agencies such as the Flood Management Master Plan for Metro Manila and Project NOAH that aims to reduce vulnerabilities. Public advisories are also released to prepare citizens for an upcoming disaster. Concerned agencies, on both the local government units and non-government organizations, perform their task most especially in the recovery phase of disaster management. All efforts in disaster management are considered to have a valuable importance but in most studies in other countries imposed that a community-based disaster management is more effective approach in disaster preparedness and response.

The four (4) phases of disaster or emergency management are consisted of mitigation, preparedness, response, and recovery. These seek to mitigate the effects of hazards, prepare the population in case a disaster occur, facilitate response when it occur, and help the community in the recovery process. Large scale disaster management is often focused on the first phase of disaster management while local agencies and non-government organizations are focused on the recovery phase. Community based disaster management is more focused in the preparedness and response of individual affected by these phenomena. Forecasting the events of disaster as seen in television is quite the least effective form of information dissemination. Several media platforms in information dissemination can now be utilized and maximized and these have been proven to be more effective to get information. The accessibility of mobile phones can be maximized as a source of information in this phase of disaster management. Information is more valid if told on actual situation.

Resilient public alert and warning tools are essential to save lives and protect property during times of national, regional or local emergencies. An effective community based disaster management alert system is one way of risk reduction and disaster management focusing on preparedness and response. To effectively address the problem of barangays in disaster management, an in-depth analysis on the causes of vulnerabilities along the affected barangays must be observed. This study seeks to provide a disaster management alert system for the barangays located near the Pureza Floodgate. Barangay 631, 634, and 635 of District 6, Sampaloc, Manila which have been identified as disaster prone area. Disaster management solution for the vulnerabilities identified includes designing an integrated system that can detect calamities such as flood, rainfall, earthquake, fire and smoke as they happen within range. The use of different environmental sensor nodes and image processing concepts will be implemented to detect occurrences or phenomena. The system will send notification alerts on officials and individuals residing in the community on a real-time basis.

Disaster preparedness is one of the important aspects in urban areas. This study integrates different alert systems such as flood monitoring, rainfall meter, seismic activity, smoke and heat detectors on a single on-board chip using field programmable gate arrays (FPGA) and send alert warnings to different concern agencies or individuals via SMS on a real-time basis. The combination of FPGA and microcontrollers provides more complex applications with sensor technology. FPGAs have embedded communication architecture capable of interconnecting with different components that can facilitate integration. By integrating different sensors with FPGA, an immediate alert system will be sent over to mobile phones via SMS that will keep respondents updated during these occurrences.

Synthesis and justification of related literatures

Disaster can be defined as an emergency situation that is out of control. Different frameworks on disaster management have existed and were developed either on a large scale (national level) or small scale (local). The impact of natural and man-made disasters greatly affects the lives of individuals and communities vulnerable to hazards. Recurring disasters such as typhoons and floods and unpredictable ones like earthquakes and fires are the most common scope of disaster management. The impact also affects the livelihood, commerce and education if not managed efficiently. Development of different approaches in disaster management is more effective when conducted on local level. In community based disaster management, individuals, local government units and non-government units formulate and implement program that is suitable to the needs of their community. Demographical assessments, status of living economic viability, and resilience of individuals are considered in their programs. Among the phases of disaster management, community based disaster risk reduction management must focus more on the monitoring and response phase. Necessary actions should be made while it happens and rapid response for emergency must follow. National government agencies forecast on changing weather conditions are helpful if they are communicated well and accurately but the transcending information on the lower level is sometimes limited by the factors mentioned. On the local level, application of advanced technology is not widely utilize especially in sub-urban areas due to financial constraints. The common problem faced by individuals in living these communities is that they are unaware of the real scenario at the event of disaster. The focus of the study being conducted is to develop and provide a real-time, immediate and responsive alert and warning system in hazard prone places during the occurrence of disasters in the community. An effective community based disaster management alert system is one way of risk reduction and disaster preparedness. Disaster management system that adapts technology is more cost-efficient and effective.

MATERIALS AND METHODS

Phase 1: Identify and understand the causes of disaster.

The first phase involves identifying the causes of natural disasters and human-induced disaster recurring in the barangays along the Pureza Floodgate. Identifying the causes of flooding, fire and earthquake will enable the researchers to have an understanding on the strategies that can be implemented to minimize the effects of these occurrences among the respondents of the barangays under study. A needs assessment survey using one-to-one interview and questionnaires will be conducted among the residents. The respondents of Barangay 631, 634, and 635 will include the local barangay officials, street leaders and selected residents.

Phase 2: Prototyping and testing of sensor nodes.

In this phase, the researchers will now construct and develop the different types of sensor nodes that will be used for the research project. These sensor nodes will collect the signals and send the data to the field programmable gate arrays. The signals collected will be converted to digital signals for processing. The signal from the sensor nodes will be the inputs of the field programmable gate array. Three types of sensor will be constructed, a sensor that will detect the amount of rain fall for flood, a sensor for smoke and fire detection using image processing concepts and a sensor that will detect seismic waves during earthquakes. Experimental method will be used in the design of each sensor nodes. This will be done and tested in a digital laboratory setting. After constructing the circuits of the sensors, simulation of disasters to each of the sensor will be done to determine the functionality of the sensor nodes before testing on actual disaster occurrences.

Color-Coded Rainfall Advisories

Color – Code	Amount of Rainfall in millimetres (mm)	Category of Rainfall	Immediate Response
Yellow Warning	7.5 – 15 mm (Approx.) 2 gal/ sq.m./ hr	Heavy	**Monitor** the weather condition
Orange Warning	15 – 30 mm 4 – 8 gal/ sq.m./ hr	Intense	**Alert** for possible evacuation
Red Warning	More than 30 mm 8 gal/ sq.m./ hr	Torrential	**Evacuation**

**Source: PAGASA*

Color-Coded Flood Level Advisories

Color – Code	Amount of Rainfall in millimetres (mm)	Advisory	Immediate Response
Yellow Warning	7.5 – 15 mm (Approx.) 2 gal/sq.m./hr	Flooding is possible	**Monitor** the weather condition
Green Warning	15 – 30 mm 4 – 8 gal/sq.m./hr	Flooding is threatening	**Alert** for possible evacuation
Red Warning	More than 30 mm 8 gal/sq.m./hr	Serious flooding is expected	**Evacuation**

**Source: PAGASA*

Phase 3: Simulation of inputs and outputs to the Field Programmable Gate Array.

This phase requires the use of a computer system and programming software for simulation of inputs and outputs. After testing and simulation have been made with the different sensor nodes, these will be connected to the different I/O blocks of the FPGA board. The field programmable gate array functions as the main controller of all the components of the design project. The FPGA was chosen as the primary controller because of its capability to process multiple inputs simultaneously and wide application in image processing. The components consist of the different sensor nodes, a loud speaker, an Arduino SMS/GPS shield attached to the FPGA module. The use of FPGAs in integrating several inputs such as sensors in its logical blocks can produce a faster and real-time output. The FPGA collects the data or signals from the different sensor nodes, processes the signals, and sends the applicable alert text message to the different respondents during disastrous situations, and rings the alarm system. Simulation will be done using Verilog, specialized software used for coding FPGAs, and Arduino IDE (using C++ environment) for coding the Arduino SMS/GSM shield.

For this research project, the Arty FPGA board will be utilized. Arty is a ready-to-use development platform designed from the Xilinx FPGA Artix-7 model.

Alert type for Disasters

Fire	Fire/Smoke Detection	Alert
Flood	Yellow Code Orange/Green Code Red Code	Warning Alarm Alert
Earthquake	Seismic Activity	Alarm

This table will serve as a guide in programming the messages to be sent to the respondents when an activity is in occurrence.

Phase 4: Sending output signals.

This phase of the project defines the output signals that will be sent to the respondents of the proposed system. Output signals will be in the form of text messages and will activate the siren when a disaster is detected by the sensors. Since most individuals own a mobile phone nowadays, it is ideal that to send the alert messages through this medium which is also more cost-effective. The respondents are the barangay officials, selected residents, and agencies, identified in the first phase, of Barangays 631, 634, and 635. The messages will be pre-formatted accordingly and will be broadcasted to the recipients instantly during occurrences of disaster. Activating a light warning during night time will also be used.

Proposed Alert Messages during a Disaster.

Hazards	Alert Message	Concerned Agencies
Fire	"Isang sunog ang kasalukuyang nagaganap sa inyong barangay. Mag-ingat. Siguraduhing ligtas ang inyong sarili at pamilya"	Nearest Fire Station
Flood	Code – Yellow or Orange: "Heavy rain is experienced around the area, flooding is possible within the next hour. Keep safe" Code – Red: "Torrential rain is currently experienced around the area, flooding is expected within the next hours. Stay dry and keep safe."	Local Disaster Management Council

Earthquake	"Isang lindol ang kasalukuyang nagaganap sa ating barangay. Maging handa at siguraduhing ligtas ang sarili at pamilya"	Local Disaster Management Council

Phase 5: Evaluation and impact assessment on the respondents.

Upon completion on testing and simulation for the prototype of the "Disaster Management Alarm System using Field Programmable Gate Arrays", and installing the prototype in its most strategic location covering the perimeter of the three barangays under study, evaluation and impact assessment will be conducted. The evaluation assessment correspond the use of questionnaires and one – to – one interviews to determine the level of awareness and alertness of the respondents during state of disaster emergencies. Impact study will help develop new alternatives in solving the communities' problems in disaster mitigation. Data gathered among the respondents will be evaluated using Pearson's correlation method. The respondents in this phase will include the barangay officials and selected residents as well as the partnered agencies concerned in disaster management of the barangays involved (Brgy. 631, 634 and 635 of District 6, Sampaloc, Manila).

Theoretical Framework

This research project, sought to provide an improvement of previous studies conducted. The present study provided key concepts on disaster management system, field programmable gate arrays, sensor technologies, alert systems and short message services.

Community based disaster management system would focus on the monitoring and response on disaster during its occurrence. Through the combined efforts of local government and non-government organizations, damage to life and properties may be reduced if individuals living in the community are well informed of the emergencies that occur in their vicinity. Hazard profiling was conducted to address the needs on disaster management and develop a unique set of solutions particular to the community. Mitigation and recovery plans would be improved upon assessment of hazards.

The use of field programmable gate arrays for digital signal processing and control process would be developed. Its capacity to perform unlimited mathematical computations made it easy for simulations and integrating other peripherals. The combination of FPGA and microcontrollers provided more complex applications with sensor technology. FPGAs had embedded communication architecture capable of interconnecting with different components that can facilitate integration of various I/O blocks.

Sensors for different environmental conditions were integrated in this project. Prototyping different sensor packages for optical or photoelectric detectors, ionization detectors, air sampling detectors for fire detection , piezoelectric pressure sensors and water levelling sensors for flood and rainfall detection and prediction, vibration sensors for earthquakes were incorporated with FPGA and microcontroller circuit.

Alert systems would be in the form of laudatory and visual that would give impact to the community during the event of disaster. The degree of separation between warning, alarm and alert would be defined for the purpose of properly reacting on the situation.

SMS (short message service) from GSM (global system for mobile) is one of most-widely used technology in cellular phones. It enables a device to send and receive short message service via GPRS. Signals from these sensors would be used to initiate transmission

of a message to different individuals and agencies giving alert at a particular period of time. Through this, necessary precautions and quick response to the event can be organized.

Significance of the Study

The system would be significant to the local officials of Barangay 631, 634 and 635 of District 6, Sampaloc, Manila in the task of monitoring the state of their community during the events of disaster. Public warnings can be automatically sent to them, their constituents and concern agencies in disaster management via text messages in real-time. Public safety and awareness can also be observed with the residents during disasters. Other agencies and non-government organizations concern in disaster management would have automatic update on the community that will result to quick response.

Disaster preparedness and response would be addressed on a community-based program based on the different hazards present within the barangays. The effect of disasters as to damage to life and property can be minimized if the residents observe alertness during such phenomenon.

Improvement and development plans of the barangay may also be imposed upon identifying the different risks in the community.

Scope and Limitations

The study was made particular for the disaster management alert system of adjacent Barangays 631, 634 and 635, Sampaloc, Manila. The device prototype wouldl detect disaster occurrences of flood, earthquake and fire using different sensors integrated in a FPGA board that will send alert warnings and advisories via SMS. The system may be applied to similar locations with the same demographic reference for its purpose.

However, the system does not predict or forecast disasters. It detects disasters as they happen. Text messages from the system do not support replies.

Definition of Terms

The following terms are the theoretical definition of the terms commonly used in this paper:

Arduino – is an open-source platform used for building electronics projects. It consists of a physical programmable circuit board or microcontroller and software or Integrated Development Environment that is used to write and upload computer code to the physical board.

Arduino GSM shield – connects the Arduino to the internet using the GPRS wireless network. You can also make or receive voice calls and send or receive SMS messages when a plug-in SIM card is plugged in this module.

Demography – the study of both quantitative and qualitative aspects of human populations. Quantitative aspects includes composition, density, movement, size and structure while qualitative aspects are quality of education, crime, development, social class, wealth and well-being.

Disaster mitigation – are those that eliminate or reduce the impacts and risk of hazards through proactive measures taken before a disaster occurs.

Hardware Description Language (HDL) – a programming language used to describe the behaviour or structure of digital circuits. HDLs are used to simulate the circuit and know its response.

Hazard – a situation that can cause a level of threat, damage or harm to humans, health, property or environment.

Image Processing – a method to perform operations on an image in order to get an enhanced image or extract some useful information from it.

Piezoelectric sensor – a type of sensor that is widely used to measure the changes in pressure, temperature or force by converting into electrical signals.

Vulnerability – the quality of being exposed to hurt, injury or attack.

Research Design

The research methodology to be applied in carrying out the research project would be through conducting an action research. The researchers aimed to develop a disaster management alert system that would help reduce the damage caused by natural or human-induced disaster. This would be done by informing the barangay officials and residents of a disaster that is currently happening so that safety precautionary measures will be taken into action immediately. With this, awareness and alertness on response can be made during disastrous situations. Experimental approach wouldl be used in the design, integrating and simulation of the prototype whose components includes sensor nodes, FPGA module, alarm system and SMS shield.

Research Setting

The research project was intended to be utilized and specifically designed for the barangays along the Pureza Floodgate. These barangays were consisted of Barangay 631, 634, and 635 of District 5, Sampaloc, Manila. Prototyping of the device would be done in a digital laboratory setting.

Respondents of the Study

The respondents of the research project from each of the barangays involved (Barangay 631, 634 and 635) were the following:

Barangay Officials	(9) x 3
Residents	(5) x 3

Other recipients for the text messages alert would include:

For Fire emergencies:	(2) nearest Fire stations
For Flood warnings:	(2) City/ Local Disaster Coordinating Council
For Earthquake:	(2) City/ Local Disaster Coordinating Council

Total respondents for the three (3) barangays would be equal to forty eight (48) respondents.

Data Gathering Procedures

Survey questionnaires and one-to-one interviews would be conducted in needs assessments (Phase 1) and impact study (Phase 5) among the respondents of the research project. Semi-structured observation on the phenomena (flood, fire and earthquake) may also be conducted as necessary. Experiments would be done in prototyping, testing and simulation of the components needed in the design.

Data Gathering Instruments

Hardware and software requirements were needed for data gathering on the sensor signals (Phase 2). The Arty FPGA module would gather the data from the sensors and evaluate the data (Phase 3), then send the applicable output signal based on the phenomenon (Phase 4). Arduino GSM shield would be used to send SMS text message alert to the mobile phones of the respondents.

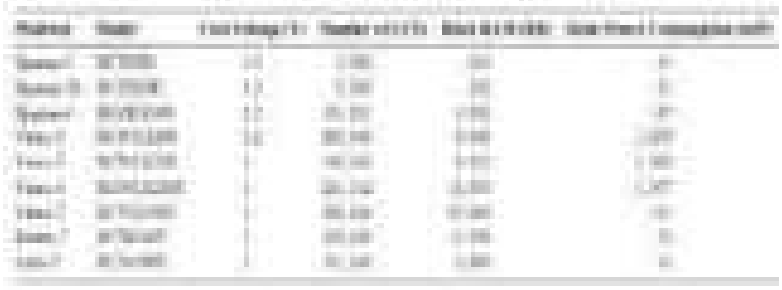
Verilog HDL and Arduino IDE firmware would be used in configuring and simulation of the I/O devices attached to the FPGA.

Statistical Treatment

In the first phase of the research project, T-Test would be used to evaluate the needs assessment among the respondents of the barangays under study. The level of awareness of the respondents would be determined. On the other hand, Pearson's correlation method would be used to evaluate the results of the assessment of the impact study on the output of the research project. The suitability and acceptability of the research would be determined using this statistical method.

RESULTS AND DISCUSSION

A sensor network consisted of a set of sensor nodes made up of one or several processing elements sensors and a transceiver which sends measurements from the sensors to a gateway that routes the data. Communications were typically based on the IEEE 802.15.4 standard due to its focus on low-power communications and simplicity. Field-Programmable Gate Arrays (FPGAs) played a key role in in order to provide an extra level of processing with the aim of compressing the sensor measurements into short messages, alerts or information about events. FPGA technology can be used in the implementation of smart transducers, either sensors or actuators. In doing so, sensors were provided with extra processing capabilities. Thus, sensors were offered a particular interface, which provides ways for performing calibration, self-testing and configuration of the sensor according to different parameters. Therefore, smart transducers can group several sensors at once, sharing the same interface that can be accessed from a sensor node. The Xilinx Artix-7 FPGA provides an optimal balance on reduced power consumption and reconfiguration capabilities and it also offered high speed transceivers and powerful DSP slices.

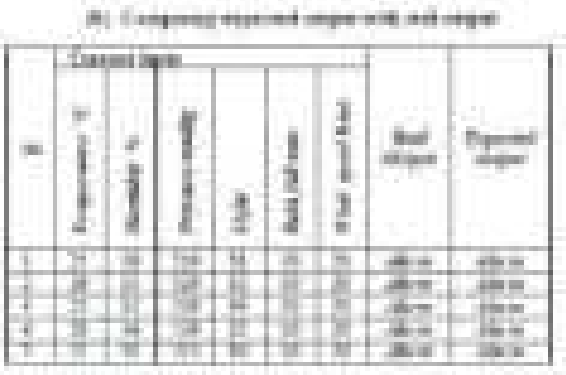


Power consumption and operating voltage of Xilinx FPGAs

Current systems are primarily based on satellite and microwave imaging techniques, which are expensive, can be inconsistent and hazardous, and need complex algorithms to incorporate the effects of noise and wind. Other systems use ultrasonic, electromagnetic, chemical, and radiation sensors for flood prediction, which are prone to interference from phenomena such as temperature fluctuations, humidity, and electromagnetic noise.

Decision tree may be used to analyze and process the data having the following parameters.

T is temperature, H is humidity,P is pressure, L is light,
R is rainfall, W is wind.



CONCLUSION

In this project, an embedded system on disaster management was designed and implemented in hardware using sensor technologies, Arty Artix7 FPGA development board and GSM Shield. The design can be of great help in monitoring and give immediate alerts during fire, flood and earthquake. An effective disaster management alert system reduced vulnerabilities caused by these natural occurrences.

REFERENCES

Abbott, Patrick L., Natural Disasters (2013), 1-5, 205, 329

Asif, Omar, Hossain, Md. Belayat, Hasan, Mamun, Rahman, Mir Toufikur, et al, (2014), Fire Detectors Review and Design of an Automated, Quick Responsive Fire Alarm System Based on SMS

Brown, Jeff, Shipman, Bill, Velter, Ron (2007), SMS: The Short Message Service, Computer: Innovative Technology for Computer Professional p. 106-110

Bustamante, Leonardo Jr. B., Labatorio, Robert Ray (2009), SMS Applications with Unlimited Service Registration and Indicator

Cervantes, Mark (2011), Community-Managed Disaster Risk Reduction in Local Government Planning – A guide to Local Government Units, 3, 32-34

Chua, Maxwell, Aquino, C., Santos, J.V., et al. (2012), File Sending via Different Mobile Channels: An Opportunistic Approach, Philippine Engineering Journal, 31-40

Commission on Audit (2014), Disaster Management Practices in the Philippines: An Assessment, 2-5, 33-38, http://www.coa.gov.ph/phocadownloadpap/userupload/DRRM/

Consolidated Number of Fire Incidents in the National Capital Region (2014-2016), Bureau of Fire Protection, Intelligence and Investigation Division.

Coppola, Damon P.(2015), Introduction to International Disaster Management 3rd Edition, 1-6, 36-37, 556-557

De la Piedra, Antonio, Braeken, An,&Touhafi, Abdellah (2012), Sensor Systems Based on FPGAs and Their Applications: A survey. www.mdpi.com/journal/sensors

ECHO, UNESCAP, ADPC (2008), Monitoring and Reporting Progress on Community-Based Disaster Management in Philippines, Partnership for Disaster Reduction – South East Asia

Fajardo, Jovilyn P., Oppus, Carlos M. (2010), A Mobile Disaster Management System Using the Android Technology, WSEAS Transactions on Communications, Issue 6 Vol. 10 ,

Gandla, Sandeep, Al-Assadi, Waleed K. et al (2008), Design and FPGA Prototyping of a Flood Prediction System, IEEE Xplore

Guidelines for Implementing the Integrated Community Disaster Planning Model (2003), Philippine National Red Cross, 1-20

Hidyat, Taufal (2016), Disaster Management System Using Energy Harvesting Sensor Network Technology: A Research Proposal, International Conference on Technology Innovation and Society

Hidyat, Taufal (2016), Disaster Management System Using Energy Harvesting Sensor Network Technology: A Research Proposal, International Conference on Technology Innovation and Society

Karthik, S., Vishal, Prasanna, Jayaram SG, Priyadarsini, K. (2014), GSM Based of FPGA, http://www.iosrjournals.org/iosr-jvlsi/papers/vol4-issue4/Version-2/I04425861.pdf

Lewis, Sean (2009), Remote Sensing for Natural Disasters: Facts and Figures http://www.scidev.net/global/earth-science/feature/remote-sensing-for-natural-disasters-facts-and-figures.html

Mandi, R.M., Pawar, Ketan, Wagh, Vardhan, Patil, Pratik (2016), FPGA Implementation of Flood Monitoring System, International Journal of Engineering Technology, Management and Applied Sciences. Vol.4 Issue 2, 193-196, www.ijetmas.com

National Economic and Development Authority (2017), Philippine Development Plan 2017-2022, www.neda.gov.ph

National Disaster Risk Reduction and Management Plan (NDRRMP) 2011-2028 http://www.who.int/hac/crises/phl/philippines_ndrrmp_2011_2028.pdf

Oldfield, John V, Field Programmable Gate Arrays, Reconfigurable Logic for Rapid Prototyping and Implementation of Digital Systems, 259-260

Orejas, Tonette (2012 December 18), Mapping Flood Hazards goes Hi-Tech in Across the Nation, Philippine Daily Inquirer

Perdikaris, John(2014), Physical Security and Environmental Protection, 1-5

Smith, Gina R. (2010) FPGAs 101, Everything You Need to Know to Get Started , 1-2, 43-47, 191, www.newnespress.com

Svensson, Aron, Flod, Jonathan (2014), System Design of an FPGA and Analog Based Point-to-Point wireless link, Chalmers University of Technology, Sweeden

Yawut, Cholatip, Kilaso, Sathapath (2011), A Wireless Sensor Network for Weather and Disaster Alarm Systems


Behavioral
Research

ENGAGING LESS PERFORMED LEARNERS THROUGH EMPOWERMENT

Elsa R. Cagatan
Gloria T. Miano

INTRODUCTION

Living with the world of rampant changes noticeably, morally, ardently, lucidly aiming to satisfy needs and satisfaction of the environment. Education made also many changes in all aspects wherein the learner is the center most, and educators are to take the challenges to let students waste none of their present by doing everything with it, to mold them for what they could be and they will be what they should be. Let them face the things they fear with arms of positive attitude such as perseverance, obstinacy and ability to envision appropriately the problems come across.

Knowingly, most students know the importance of mathematics for everyday living, however, thinking the agony of the processes in the classroom in doing it tends to hinder the learning especially to the less performed learners. By giving them chance and to discover the efficacy of having fulfilled the task that can vaunt the interest to do more and achieve more. Enriching their experiences in learning by doing, engaging with dependable assessment tools and practice build from enablement (inquiry skills, conceptual understanding, and deepening understanding) for the tasks constructed and formulated by the learners itself. Giving the chance to experience incidental learning which trigger self- reflection and be encourage to reconceived learning fragments as part of longer term learning journeys by interpreting new information while understanding its relevance and meaning.

Studying the problems encountered by the less performed students in mathematics in terms of basic knowledge (terms, symbols, and equations), computational skills (addition, subtraction, multiplication, and division), open- ended problems (true to life situations) are the basis for the development of the assessment tool. How do the students performed before constructing and after using the instrument and how acceptable and valid is the instrument as to content, expediency, and efficacy as well as its implication to the learners? These are the main goal of the research.

By observing students doing what they learned, how they respond differently to their emotional and cognitive states such as their facial expressions- smiling if they get the answer and frustration if they can't. However, if confused or destructed they try to find strategies like- reflecting on what have learned, seeking help from others/peers and empowering deeply by self- teaching to learn, responsive to an appropriate way of their emotions and dispositions. They could have self- realization that for every reaction they will do in whatever problem they tackle the primary benefactor is themselves so they should choose what is best for the future, as one media advertisement said "author your future". They could experience rhizomatic learning (learners work together) in dynamic ways to determine their own modes of learning.

MATERIALS AND METHODS

The study used the experimental design that involved one group of students wherein all the treatments were provided to same subject being controlled and compared. The selection of the sample was by random sampling- allowing the researchers to form a group that is right at the beginning of the study intended to eliminate extraneous variables that might affect the outcome of the study.

In analyzing the data and relating variable within the group, quantitative and correlation coefficient technique were used in finding the relationship of the performance of the less performed learners.

The first phase of the study was conducted to help and give suggestions, ideas and model of a Collaborative- Project – Based Assessment Tool (CPBAT) - constructed and formulated by the learners itself (group of 7 for collaboration, Math 4 for undergrad thesis) and answered by group (respondents of the study- Math 1), however, individually answered as formative assessment every after instruction. The second phase covered the construction of Self- Produced- Assessment Tool (SPAT) by the subjects of the study done after the class instruction. The acceptability of the model as collaborative performance-based- assessment tool (CPBAT) for pre-self- evaluation in improving the level of performance of the respondents will be based on their performance after answering the peer's SPAT and compared to the teacher's made test questions. The information of the study gathered using checklist style (as Leder, use adjective check list to tap stereotypes of outstanding mathematics students)- researchers made questionnaire for the acceptability and the conclusion drawn from the study obtained from the subject, (group of learners) and performance of the object of the study determined the acceptability of the SPAT model as to content, expediency, and efficacy as well as its implication to the learners.

In relation to the topics in the SPAT established from difficult to most difficult and less performed learners which focused in the Management Science of the Contemporary Mathematics- course, EARIST-college of education.

Data Gathering procedure:

1. The subject was given a mathematical checklist survey questionnaire to identify the problem encountered in contemporary mathematics.

2. Administer the pre-test

3. Introduce the CPBAT to the subject to be used as formative assessment tool after instruction

4. Group the subject for collaborative teaching-learning in the construction and formulation of the SPAT

5. After the whole sessions administer the post-test.

6. Data analyses and interpretation

RESULT AND DISCUSSION

Phase I: The study found that the students experienced difficulty with 54.58% in basic mathematical knowledge such as basic terms (inequalities, solution set, matrix, …), basic symbols (≤, ≥, [ ], <, >,…) basic equation. Computational skills (addition, subtraction, multiplication, and division of numerals) was 53.93% experience difficulty due to the following factors, pattern recognition, abstraction, algorithm, or debugging (SRI Education, 2015) and experience very difficult, 55.24% in open-ended problems (applications to real life situations).

This difficulties experiencing by the subject should be tackled and answered. The researchers took the challenge and designed a collaborative-project-based-assessment tool to be constructed and formulated by the subject of interest, maybe called as Self- Produced-Assessment Tool for self- evaluation. The complex concepts and skills that should be improve

is the main concern which through direct purposeful experiences or firsthand sensory experiences makes learn concept and skills effectively. (Corpus, B. B. and Lucido, P. I.) 2015.

Providing learners authentic and engaging opportunities for learning, drawing experiences across multiple settings, the wider opportunities to support learners in linking, recalling, recording and sharing their diverse learning events to peers. Incidental learning may occur while carrying out the activity that is unrelated to what is learned, furthermore, it may trigger self-reflection. They can have an argumentation that let them learn how to listen actively and how to take turns when responding constructively to others. Computational thinking is a powerful approach to thinking and problem solving which involves breaking large problem down to smaller one, recognizing how these relate to problems solve in the past setting aside unimportant details and identifying/ developing steps that is necessary to reach a solution and refining the steps. Adaptive teaching experiences from the problems learners encountering using the same materials, by putting the burden on the learners to figure out how to engage with the content that made some bored, lost and likely to discover personal paths for the solutions that result to optimal learning.

It also provided various tools for monitoring one's progress build on learning practices such as textbook reading, searching using the internet, watching educational video and computer tutorials related to help successfully formulate and develop the SPAT that gave the learners a sense of ownership. It operated a flexible learning environment that supports collaborative teaching-learning within the teams who cater for and maximize personalized learning journey for all the members of the group ensuring the academic engagement and well-being of all the members of the group.

While in the performance of the students before and after using the instrument, ranging from 55.90% as average in the level of mastery and 90.46% as closely approximating mastery, respectively shows the progress performance of the learners based on the result give an evidence of learning by doing and provide further evidence of the importance of attitude as one factor influencing achievement.

Empowerment given to less performed learners was a challenge and a fulfilment to every member of the group. It was giving freedom to learners to choose what to do first, how, when, where to do and why not to do as well being accountable of all the work done.

For the acceptability and validity of the instrument as to content, expediency, and efficacy were assessed acceptable and very acceptable based on the work done by the Math 4, led by Mary Maureen A. Resos and Lecel O. Tamban.

CONCLUSION AND IMPLICATIONS

From the findings, the researchers conclusions that each student experienced difficulties differently in mathematical terms, computational skills, open- ended problems maybe to their diversity towards learning which was perceived from their performance in the pre-test and post-test although it is closely approximating mastery, Furthermore, the instrument was acceptable and also valid to be used to the students for those educators who need another materials and strategy to measure the teaching- learning of the learners. The process Collaborative – Project- Based Assessment Tool (CPBAT) and Self-Produced-Assessment Tool (SPAT) would be a great help not only for the learners but as well as for the educators most to mathematics learning.

REFERENCES

Corpuz, B.B. and Lucido,P. I. (2015). Educational Technology1. Lorimar Publishing House.

Fraenkel, J.R. and Wallen, N.E. (2007). How to Design and Evaluate Research in Education. Published By McGraw-Hill in the Phillipines .

Navarro, R. L., Santos, R. G. and Corpuz, B.B. (2017). Assessment of Learning. Quezon City, Phillipines: Lorimar Publishing House.

Leder. G. C. (1985). For learning of mathematics. FLM Publishing Association, Montreal, Quebec, Canada.

Sharples, N., Adams, A., et.al., (2015). The open university innovating pedagogy 2015. Open University Innovation Report 4. Creative Commons. Org./ licensed/ by/30

File:///Downloads/innovatios_pedagogies_2015.pdf. Educational terms theories and practices.

EFFECTIVENESS OF INDIVIDUALIZED READING COMPREHENSION OF FIRST YEAR COLLEGE STUDENTS OF ECC

Jeanette T. Gabica
Olivia T. Picar
Nelia A. Ortega

INTRODUCTION

All serious educators have long been convinced excellence in education can never be attained until the student is challenged to learn at the rate he is able (Smith, 20:201). While the concern of every committed teacher is to enable the student to reach his maximum learning potential, it is generally known that the most pressing problem in this field concerns mediocre achievement. In order to learn however, one has to engage in reading. “Reading is the most crucial of the fundamental language skills” (Duffy, 6:3). Yet some people read only when they need to.

In the United States, an estimated $237 billion is lost each year due to illiteracy (Henneberg, 26:53). Furthermore, while 98 percent of the nation’s seventeen year olds can demonstrate reading skills, fewer than 40 percent of them are able to comprehend, summarize and explain what they have read.

Since people read at various rates, the use of individualized reading has been advocated by many reading experts. Its popularity in enhancing the growth of the reading process has always been the subject of closer introspection among intellectuals. Its notion lies in the concept that since there are tremendous individualized differences among students, there is little justification for assuming those students’ needs and interests will be met equally by one basal series or a single text (Heilman, 12: 309). The rationale behind individualized reading is the thesis that students learn best when they move through increasingly higher achievement levels at their own rates of speed, use materials in which they are personally interested, and receive instruction in the basic skills at the time they are appropriate and needed (Kennedy, 15:68).

In their comments regarding the future of the individualized reading approach, Harris and Sipay (10:109) started:

It seems probable that setting aside substantial time periods for independent reading accompanied by reading program in more and more schools. Practice materials for the development of specific skills on an individual basis will be widely used as supplement to the basal reading program.

Through little attention has been given individualized reading in the past, Javan (29) believes that a systematic approach on an individualized basis can improve reading comprehension. “Given the freedom they can have, well-educated, experienced, and dedicated teachers who can organize their classes in several ways for differentiating reading teaching” (Smith, 20:34).

MATERIALS AND METHODS

The quasi-experimental, pre-test post-test non-equivalent designs were used in this study. The standardized Allternate Philippine Reading Test was employed as a pre-test to check equivalence for reading comprehension.

The control group received the traditional basal technique, and the experimental group, the individualized reading approach. The experimental group received the treatment thrice a week for nine weeks. A post-test was administered at the end of the experimental period. The t-test was employed to analyze the hypotheses. The Ottis Lennon School Ability Test measured the intelligence quotient level of the experimental samples.

Research Instrument. The researchers utilized the Alternate Philippine Reading Test constructed and validated by Maria G. Tumangday in 2000, and updated by Bayani N. Agnazata at present as pre-test and post-test. Although the Alternate Philippine Reading Test measures five aspects of reading, the researchers made use of the words, sentence, and paragraph meanings to measure the first four hypothetical statements. Vocabulary words, college freshmen, comprised the first portion of the test. Short, and appropriately selected passages gauge the students' understanding of sentence and paragraph meanings.

The Teaching Instrument. Since this study tried to determine if the effect of the individualize reading approach on the reading comprehension of freshmen college students demanded much reading materials, the library provided this need. Reading materials ranging from books, magazines, periodicals at different levels of difficulty were made available to the students at the time of the program.

RESULTS AND DISCUSSIONS

Problem One: To determine the effect of individual reading on reading comprehension.

Since the t-obtained value had no significant difference between the reading comprehension as a whole of students who engage in individualized reading and those who do not is rejected. This means that students' reading comprehension had significantly improved with the individualized reading approach. This result supported the idea that comprehension occurs when a student selects and reads materials from variety of books available for him as he moves at his own pace. (Distefano, 4:248). Furthermore, less intelligent and slow readers moved at their own speed. Since intelligent students accomplished more readings in less time. They had ample time to assist their slow classmates through peer teaching.

Problem Two: To determine the effect of individualized reading in word meaning comprehension.

Since the null hypothesis is rejected, students' capacity in unlocking vocabulary increased with individualized reading. Word meaning comprehension significantly improved with the approach. Individualized reading provided many different experiences that help students expand their reading vocabulary. They learn hundreds of words in less time than it would take them to memorize a prescribed vocabulary of thirty or forty words answering the "WH" questions (Howes, 13; 19)

This idea is supported by Dinkmeyer who stated that wide reading makes competent readers' vocabulary grow. As countless hours are spent in reading, new words in similar and differing contexts are met, often with some reading comprehension at each level. Acquisition of meaning is the prime goal of reading and practice reading materials must coincide with the students' background and performance (Dinkmeyer 3; 324).

Problem Three: To determine the effect of individualized reading on sentence meaning comprehension.

Sentence meaning comprehension improved with individualized reading since the null hypothesis is rejected. This means that when students analyze statements that will sharpen their mentality, they resort to extensive. Extensive reading in turn develops in them the attitude to question the validity of the facts in the statement of the books they read (Petty, 18:377).

A reading material on the ability level of the students encourages him to move rapidly on the line (Kennedy, 15:293). Extensive reading is enhanced when students develop the attitude to question the information in the books they read (Petty, 18:337). Comprehension is realized as extensive reading develops the critical mind needed to analyze facts and opinions.

Problem Four: To determine the effect of individualized reading on paragraph meaning comprehension.

A positive effect resulted in the paragraph meaning comprehension if the experimental group after the data revealed a significant difference in the post-test mean scores of students with individualized processed in the students' mind. Meanings are perceived through a thought-span reading, says J. O. Quanty (Durr, 7:189). The reader waits to perceive enough materials before a thought unit occurs. Practice using paragraphs, chapters, and complete books develop the skill for securing main ideas (Miller, 17:218). Since individualized reading promotes self-initiated wide reading, there is reason to believe that more reading materials mean more thought units (Fry, 8:24) Kennedy stressed: "Reading improvements grow through paragraph analysis" (15:296).

Problem Five: To determine whether intelligent students who engage in individualized reading gain better with individualized reading than less intelligent students.

The effect of individualized reading on reading comprehension is significant. The impact was greater on and stated that a fairly close relationship exists between intelligence and reading. More intelligent students prefer to read and even go beyond their reading is individualized, the voluntary effort needed to comprehend any reading material is supplied because the material meets the students' level. Dinkmeyer (3:14) referred to this relationship when he stated the phenomenological point of view that intelligence is a function of interaction dependent upon a wide variety of perceptions available to the student. Gifted students must and should have many chances for wide background of information needed to provide the opportunity to apply reading skills needed for comprehension (Durr, 7:189).

Problem Six: To determine whether fast readers who engage in individualized reading gain better with the individualized reading than slow readers with individualized reading.

Fast and slow readers alike are benefited by the individualized reading approach. Since slow learners are able to select reading materials according to their levels, it is likely that both groups will increase in their reading comprehension.

This must have been the point of individualized reading enthusiasts when they asserted that teachers enhance the student's speed in comprehending material read, when it is accompanied by satisfactory comprehension as a result of efficient and interesting reading (Smith, 20:5). Furthermore, gifted learners are able to develop a system of cues so quickly and so easily that they use a vast number of words easily, perform different tasks, and are alert and observant (Smith, 20:5). Slow learners, on the other hand, progress more comfortably when given materials at their level of understanding.

CONCLUSIONS

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

1. The individualized reading approach increases reading comprehension to a significant degree.

2. Individualized reading improves the students' capability to unlock difficult meanings of words. The meaning of a sentence is more fully understood, if reading is individualized.

3. Paragraph comprehension comes more easily through the individualized approach reading.

4. Intelligent students with individualized reading comprehend more in reading than their less intelligent counterparts.

5. Fast and slow readers alike benefit from the individualized reading approach. Self-selected reading develops in both groups reading comprehension to a significant degree.

REFERENCES

A. Books

Dallmann, Martha, et al. The Teaching of Reading. New York: Holt, Rineheart and Winston, Inc., 2004.

Distefano, Philip, et. al. Elementary Language Arts. John Wiley and Sons, Inc. 2004.

Howes, Virgil M. Individualizing Instruction in Reading and Social Studies; Selected Reading on Program Practices. The McMillan Co. 2007.

B. Periodicals

Henneberg, Susan. English Journal. Vol. 75. January-April, 2006.

Walker, Carolyn. Individualized Reading. English Language Teaching Journal. rev. ed.

C. Unpublishedd Materials

Javan, Teotimo M. A Study of Reading Disabilities and their Treatment. Unpublished Master's Thesis. National Teachers College, Manila. 2004.

Tumangday, Maria C. The Individualized Approach to Reading Instruction. 2000.

SOCIAL MEDIA ENGAGEMENT AND ITS EFFECTS TO BUSINESS STUDENTS LIFE: BASIS FOR COLLEGE INTERVENTION PROGRAM

Willy O. Gapasin

INTRODUCTION

Today's generation are globally generated by the social networking inherently dependent to the internet. Everyone is connected to one another, in this vast network. In the past, communicating and free sharing of thoughts among people were restricted by long distance, nationally and/or regionally. But now, even the barriers cannot stop the flow of information and knowledge. The new social media allows sharing thoughts.

This study is to influence social media on students on personal, social, academic, health and economic affairs. Nowadays, social media is essential for the business students in the field of education to learn new trends in here, to improve writing and communication skills, cultural promoting, religious and political information gathering and sharing links, better living style, growth and development of society.

MATERIALS AND METHODS

This study employed a quantitative descriptive research design in which data collected were analyzed furthermore it involved description and interpretation of condition that exits. This method of research is a fact-finding study with adequate and accurate interpretation of data. It described with emphasis what actually exists such as the current condition of the phenomenon wherein the researcher gathered data on the usage and efficiency of printed and electronic learning materials among undergraduate students of EARIST-College of Business Administration.

The selected respondents were the undergraduate students of the EARIST-College of Business Administration, composed of the First Year to Fourth Year students from different courses, such as: Bachelor of Science in Administration, Bachelor of Science in Office Administration, Bachelor of Science in Entrepreneurial Management, and Bachelor of Science in Human Resource Management. The purposive sampling technique, a well-accepted method for rigorous selection of respondents was utilized in this study.

The following instruments to gather data are the following: Documentary Analysis and Survey Questionnaire. The data and information tallied and tabulated were analyzed and interpreted using the following: Frequency, Percentage, Weighted Mean, and t-test.

RESULTS AND DISCUSSION

The study resulted to several notable findings that strengthen the objectives as well as the preliminary hypothesis of the research work. The salient findings of the study are as follows.

Sub-problem No. 1: What is the profile of the business students of EARIST-College of Business Administration on social media engagement in terms of:

1.1 Course

Table 1

Business Students As to Course

Indicator	Frequency (f)	Percentage (%)
Bachelor of Science in Business Administration (BSBA)	50	25
Bachelor of Science in Office Administration (BSOA)	50	25
Bachelor of Science in Entrepreneurial Management (BSEM)	50	25
Bachelor of Science in Human Resource Management (BSHRM)	50	25
Total	**200**	**100**

As reflected in Table 1, the total respondents are 200 students, composed of the following: all courses namely: Bachelor of Science in Administration, Bachelor of Science in Office Administration, Bachelor of Science in Entrepreneurial Management and, Bachelor of Science in Human Resource Management were equally divided by fifty (50) or twenty-five percent (25%) respectively.

1.2 Gender

Table 2

Business Students As to Sex

Indicator	f	%
Female	152	76
Male	48	24
Total	**200**	**100**

As depicted in Table 2, majority of the business students' sex are female with 152 or 76 percent; only 48 or 24 percent are male.

1.3 Type of Social Media Account

Table 3

Business Students As to Type of Social Media Account

Indicator	f	%
Facebook	180	90
Twitter	80	40
Instagram	100	50
Youtube	116	58
Snapchat	32	16
LinkedIn	8	4
Total	**200**	**100**

As manifested in Table 3, most of the business students have their Facebook with 180 or 90 percent as rank 1; Youtube with 116 or 58 percent as rank 2; Instagram with 100 or 50 percent as rank 3; Twitter with 80 or 40 percent; Snapchat with 32 or 16 percent; and LinkedIn with 8 or 4 percent.

1.4 Usage Rate

Table 4

Business Students As to Usage Rate

Indicator	f	%
181 minutes and above	128	68
121-180 minutes	28	14
61-120 minutes	24	12
31-60 minutes	12	6
30 minutes and below	8	4
Total	**200**	**100**

As portrayed in Table 4, majority of the business students have spent 181 minutes and above with 128 or 64 percent; 121-180 minutes with 28 or 14 percent; 61-120 minutes with 24 or 12 percent; 31-60 minutes with 12 or 6 percent; and 30 minutes and with 8 or 4 percent.

It only shows that business students spend too much in social media for more than 3 hours a day.

Relative to the findings, Online PhD. (2010) guarantee that student spends roughly 100 minutes per day on Facebook. According to them in 2007, the number of students who used Facebook was already enormous: 92 percent of college students had an account.

1.5 Reasons of Usage

Table 5

Business Students As to Reason of Usage

Indicator	f	%
Keep up-to-date with current issues	63	31.50
Research for Educational purpose	31	15.50
Entertain with games, Videos, posts and the like	28	14.00
Connect with the family, friends, and relatives	45	22.50
Communicate with Classmates and teachers	28	14.00
Establish professional network	5	2.50
Total	**200**	**100.00**

As showed in Table 5, most of the business student's reason of social media usage is to keep up-to-date with current issues with 63 or 31.50 percent; connect with family, friends, and relatives with 45 or 22.50 percent; research for educational purpose with the 31 or 15.50 percent; entertain with games, videos, posts and the like, and communicate with classmates and teachers with 28 or 14 percent; and establish professional network with 5 or 2.50 percent.

It only reflects that business students most preferred social engagement to update themselves with different current issues either on political, entertainment and the like.

Relative to the findings, Romualdez (2015) proved that the advent of technology has given rise to the social media phenomenon which has become a powerful medium not only for news and information dissemination, but as an effective tool in driving intelligent discussion on hot issue.

Sub-problem No. 2: How do the business students assess the effects of social media in terms of?

2.1 Personal Factor

Table 6

Effects of Social Media Engagement to Business Students As to Personal Factor

Indicator	WM	VI
1. Learn to manage time from study to pleasure.	3.24	ME
2. Prefer chatting over social media accounts rather than in person.	3.64	E
3. Consider social networking as part of daily routine.	3.22	ME
Overall Weighted Mean	**3.37**	**ME**

Legend:

Scale	Range	Interpretation	Symbol
5	4.20-5.00	Highly Effective	HE
4	3.40-4.19	Effective	E
3	2.60-3.39	Moderately Effective	ME
2	1.80-2.59	Moderately Disagree	LE

As revealed in Table 6, the effects of social media engagement of business students as to personal factors rated as Moderately Effective with overall weighted mean of 3.37. One (1) item rated as Effective which is prefer chatting over social media rather than in person with weighted mean of 3.64. Two (2) items rated as Moderately Effective, such as: Learn to manage time from study to pleasure with weighted mean of 3.24; and consider social networking as part of daily routine with weighted mean of 3.22.

It only proves that business students have choose to interact over social media and able to express themselves thru posts and updates.

In relation to findings, Banfield (2009) confirmed that online social networks tap into base need of human to connect to others. And according to him connection made online often result in real-world meetings. It also allows people to valuably expand their social horizons, both professional and personal.

2.2 Social Factor

Table 7

Effects of Social Media Engagement to Business Student As to Social Factor

Indicator	WM	VI
1. Help to create real-world relationship.	3.82	E
2. Have more friends on social networking compared to real life.	3.52	E
3. Help to keep social active.	4.34	HE
Overall Weighted Mean	**3.89**	**E**

As exposed in Table 7, the effects of social media engagement of business students as to social factor rated as Effective with overall weighted mean of 3.89. One (1) item rated as Highly Effective which is help to keep socially active with weighted mean of 4.34. Two (2) items rated Effective, these are: help to create real-world relationship with weighted mean of 3.82; and have more friends on social networking compared to real life with weighted mean of 3.52.

It is given that social media encourages everyone to be socially active by suggesting person to be added in his/her account.

Relatively, Duncan (2012), corroborated that using of social media is increasing in society which is reflecting the human expression and recognition. The social interaction with educational process have been influenced the availability of modern techniques of social media.

2.3 Academic Factor

Table 8

Effects of Social Media Engagement to Business Students As to Academic Factor

Indicator	WM	VI
1. Enhance the academic learning process.	3.32	ME
2. Improve knowledge of Language thru vocabulary acquisition	2.88	ME
3. Able to become resourceful to information.	3.34	ME
Overall Weighted Mean	**3.18**	**ME**

As reflected in Table 8, the effects of social media engagement of business students as to academic factor rated as Moderately Effective with overall weighted mean of 3.18. All items rated Moderately Effective, namely: Able to become resourceful to information with weighted mean of 3.34; Enhance in academic learning process with weighted mean of 3.32; and Improve knowledge of language thru vocabulary acquisition with weighted mean of 2.88.

It only shows that business students are academically modest in social media engagement.

To support the findings, Alrahmi (2015), substantiated that social media networks can be used by students and teachers, which are present in Twitter, Facebook, LinkedIn, or other networks used to extend some part of teaching either sharing learning materials or to delude into subjects, make announcements of interest or start discussions on specific topic.

2.4 Health Factor

Table 9

Effects of Social Media Engagement to Business Students As to Health Factor

Indicator	WM	VI
1. Poor sleep patterns because of long period of usage of social media.	3.24	ME
2. Poor eye sights due to too much exposure to screen or monitor.	3.12	ME
3. Skipping meals due to staying in front of computer.	3.06	ME
Overall Weighted Mean	**3.14**	**ME**

As displayed in Table 9, the effects of social media engagement of business students as to health factor rated as Moderately Effective with overall weighted mean of 3.14. All items rated as Moderately Effective, namely; Poor sleep patterns because of long period of usage of social media with weighted mean of 3.24.; Poor eye sights due to too much exposure to screen or monitor with weighted mean of 3.12. and Skipping meals due to staying in front of computer with a weighted mean of 3.06.

It only indicates that business students do still know how to manage social media properly.

Relatively, Fraxier (2010) found that social media can sometimes result in negative outcomes, some with long-term consequences especially on health issues.

2.5 Economic Factor

Table 10

Effects of Social Media Engagement to Business Students As to Economic Factor

Indicator	WM	VI
1. Able to conduct online selling.	3.28	ME
2. Able to budget the allowance properly.	3.24	ME
3. Able to update about business strategies.	4.10	E
Overall Weighted Mean	**3.54**	**E**

As portrayed in Table 10, the effects of social media engagement of business students as to economic factor rated as Effective with overall weighted mean of 3.54. One (1) item rated as Effective which is able to update about business strategies with weighted mean of 4.10. Two (2) items rated as Moderately Effective, such as: Able to conduct online selling with weighted mean of 3.28; and Able to budget the allowance properly with weighted mean of 3.24.

It only attests that business students are aware about the consequence of social media engagement particularly on finances.

*-

Sub-problem No. 3: Is there significant relationship between the demographic profile of business students and effects of social media engagement?

Table 11

Correlation of Effects of Social Media Engagement to Business Students

Chi-square value	df	Level of significance	Critical-value	Interpretation	Decision
0.216	8	0.05	15.507	Not Significant	Accept Ho

As depicted in Table 11, the computed chi-square value on the significant relationship among effects of social media engagement to business students is 0.216 which is lower than the critical value of 15.507 with 8 degree of freedom at 0.05 level of significance. Hence, there is no significant relationship among personal, social, health, academic and economic effects on social media engagement of business students. Therefore, the hypothesis is accepted.

CONCLUSIONS

Based on the findings of the study, the following concluding statements are drawn:

1. Majority of the business students who are social media engaged are female, with Facebook account, spend 181 minutes and above with a reason of keeping up-to-date with current issues.

2. The effects of social media engagement of business students on social and economic factors were effective, and personal, academic and health were moderately effective.

3. There is no relationship among the effects of social media engagement of business students as to personal, social, academic, health, and economic factors.

REFERENCES

A. Books

Friedman, L. (2011). Social Networking. Greenhaven Press. 27500 Drake Rd. Farmington Hills, MI 48331-3535.

Noor Al-Deen, H. and Hendricks, JA. (2013). Social Media:

Usage and Impact. The Rawman and Littlefield Publishing Group, Inc. Boulevard, Suite 200, Lanham, Maryland 20706.

B. Periodicals, Journals, and Magazines

Torrevillas, D. (2017). Social Media Constructs, Destructs. The Philippine Star

C. Thesis and Dissertation

Balandan, F.M.; Edelmaier, B.N.; Lansang, P.A.; Regente, L.B. (2014). The Mediating Role of Social

Media Usage in the Relationship between Celebrity Worship and Psychological Well-being of Adolescents, De La Salle University, Manila Philippines.

Bejer, J.A.; De Leon, M.A.; and, Esparagoza, D. (2011). Social Networking Site's Effects on Academic

Performance of College Students of San Sebastian College Recoletos, Manila Philippines.

Moh'd Ddesmal, A.J. (2017). The Impact of Using Social Media and Internet on Academic Performance; Case study Bahrain Universities. Ahlia University.

IMPACT OF COMMUNITY AWARENESS TO LGBT IN SELECTED BARANGAYS, 1ST DISTRICT, MANILA

Estrellita S. Glodo
Rosemarie R. San Luis
Erlinda J. Cadiz

INTRODUCTION

In the Philippines, LGBT has some of the positive moment's history that celebrates love, respect, and pride. A Trans woman wins a congressional seat in the national elections, Bataan Rep. Geraldine Roman, the country's first elected transgender politician, highlighted in her first privilege speech on September 19, 2016 the need to pass the Anti-discrimination Bill. "Katulad po ng malugod na pagtanggap niyo sa akin ay tanggapin ninyo ang pagiging pantay-pantay ng bawat Pilipino, LGBT man o hindi," she said in an emotional address to the Lower House

Quezon City approves pro-LGBT ordinance. After 11 years, the Quezon City Council approved an ordinance that bans discrimination against LGBTQ individuals on September 29, 2014. Touted as the first legislation of its kind in Metro Manila, this measure promotes equal rights in the workplace, in schools, in accommodation, and in accessing basic services. Verbal and non-verbal ridicule, harassment, disallowance from entry and refusal to serve are also subject to either imprisonment or a fine. Aside from these, all barangays in desks for violence against women and children, (Dela Cruz, 2017).

The only bill directly concerning the LGBT community in the Philippines is the Anti-Discrimination Act. This bill seeks that all persons regardless of sex or sexual orientation be treated the same as everyone else, wherein conditions do not differ in the privileges granted and the liabilities enforced. The bill was introduced by (Hon. Kaka J. Bag-ao, 2013).

When a LGBT's experience stigmatization, hostility, and rejection over years of schooling, the cumulative effect can be devastating and long-lasting. Psychological research has suggested that "circumstances in the environment, especially related to stigma and prejudice, may bring about stressors that LGBT people experience their entire lives." (Meyer, 2015).

Statement of the Problem

The primary purpose of this study was to know the community awareness on the behaviour, attitudes, skills and competencies, and academic performance of LGBT.

Specifically, seeks, to answer the following questions.

1. What is the demographic profile of respondents in terms of:
   - 1.1 Age;
   - 1.2 Gender; and
   - 1.3 Barangays?
2. What is the perception of respondents on LGBT's in terms of:

1.1 Academic Performance;

1.2 Skills and competencies;

1.3 Attitudes; and

1.4 Behavior?

3. Is there any significant relationship in the perception of respondents on LGBT individuals when group according to demographic profile.

Research Design

Descriptive method of research involves the collection of data in order to answer questions concerning the current status of the subject of the study.

The respondents of the study were chosen through purposive sampling technique. Only LGBT individuals from the Barangays of 1st District of Manila were considered respondents in this investigation composing at least one-hundred (100).

The data gathered were compiled, collated and summarized separately per group. The responses for each item were categorized based on the specific problems raised.

The following were utilized in the treatment of the data:

Frequency and Percentage. It is the actual response to a specific item or question in the questionnaire were the respondent ticks his choice. This was used as a descriptive statistic or something that describes a part of the whole. The Formula is:

$$WM = \frac{(f_5 x5) + (f_4 x5) + (f_3 x5) + (f_2 x5) + (f_1 x5)}{N}$$

Weighted Mean. This was used to measure the respondents' assessments. Multiplying each value in the group by the appropriate weight factor it does and the product is summed up and divided by the total number of respondents.

Anova. In establishing the differences between each profile variables and the perception of indivuduals on LGBT. One-Way Analysis of Variance (ANOVA) and Independent Sample T-test in SPSS were used.

Likert Scale: For Part II

See survey questionnaire place Likert Scale model in this portion:

Option	Range	Interpretation
5	4.50 -5.00	High Impact
4	3.50 -4.49	Impact
3	2.50 -3.49	Moderate Impact
2	1.50 -2.49	Least Impact
1	1.00 -1.49	No Impact

RESULTS AND DISCUSSION

Table 1

One-Way Analysis of Variance: Comparison of Perceptions of the Respondents of LGBT when grouped according to Age in Academic Performance

INDICATORS	Age	Mean	F Value	P-Value	Decision	Remarks
Perception of Respondents on LGBT	16-17	4.00	3.03	0.03	Reject Ho	Significant
	18-20	3.75				
	21-22	3.30				
	23-Above	2.93				

Table 1 exhibits the significant difference between the perceptions of the respondents to LGBT when grouped according to Age in Academic Performance using One-Way Analysis of Variance. It was exposed by the table that the perceptions of the respondents on LGBT when grouped according to Age in Academic Performance have a significant difference because the p value is less than or equal to the level of significance which is 0.05; therefore, we reject the null hypothesis.

This implies that the perceptions of the respondents on LGBT when grouped according to Age in Academic Performance do not have the same level.

Table 2

One-Way Analysis of Variance: Comparison of Perceptions of the Respondents of LGBT when grouped according to Age in Skills and Competencies

INDICATORS	Age	Mean	F Value	P-Value	Decision	Remarks
Perception of Respondents on LGBT	16-17	4.20	2.02	0.12	Retain Ho	Not Significant
	18-20	3.64				
	21-22	3.30				
	23-Above	3.11				

Table 2 exhibits the significant difference between the perceptions of the respondents of LGBT when grouped according to Age in Skills and Competencies using One-Way Analysis of Variance. It was exposed by the table that the perceptions of the respondents of LGBT when grouped according to Age in Skills and Competencies do not have any significant difference because the p value is greater than the level of significance which is 0.05; therefore, we retain the null hypothesis.

This implies that the perceptions of the respondents to LGBT when grouped according to Age in Skills and Competencies have the same level.

Table 3

One-Way Analysis of Variance: Comparison of Perceptions of the Respondents of LGBT when grouped according to Age in Attitude

INDICATORS	Age	Mean	F Value	P-Value	Decision	Remarks
Perception of Respondents on LGBT	16-17	4.40	1.46	0.23	Retain Ho	Not Significant
	18-20	3.23				
	21-22	3.22				
	23-Above	2.72				

Table 3 exhibits the significant difference between the perceptions of the respondents to LGBT when grouped according to Age in Behavior using One-Way Analysis of Variance. It was exposed by the table that the perceptions of the respondents on LGBT when grouped according to Age in Attitude do not have any significant difference because the p value is greater than the level of significance which is 0.05; therefore, we retain the null hypothesis.

This implies that the perceptions of the respondents of LGBT when grouped according to Age in Skills and Competencies have the same level.

Table 4

One-Way Analysis of Variance: Comparison of Perceptions of the Respondents of LGBT when grouped according to Age in Behavior

INDICATORS	Age	Mean	F Value	P-Value	Decision	Remarks
Perception of Respondents on LGBT	16-17	4.00	1.40	0.25	Retain Ho	Not Significant
	18-20	3.75				
	21-22	3.55				
	23-Above	3.16				

Table 4 exhibits the significant difference between the perceptions of the respondents of LGBT when grouped according to Age in Attitude using One-Way Analysis of Variance. It was exposed by the table that the perceptions of the respondents on LGBT when grouped according to Age in Behavior do not have any significant difference because the p value is greater than the level of significance which is 0.05; therefore, we retain the null hypothesis.

This implies that the perceptions of the respondents of LGBT when grouped according to Age in Behavior have the same level.

Table 5

Independent Sample T-Test: Comparison of Perceptions of the Respondents of LGBT when grouped according to Gender in Academic Performance

INDICATORS	Gender	Mean	F Value	P-Value	Decision	Remarks
Perception of Respondents on LGBT	Male	3.50	-0.16	0.87	Retain Ho	Not Significant
	Female	3.54				

Table 5 exhibits the significant difference between the perceptions of the respondents of LGBT when grouped according to Gender in Academic Performance. It was exposed by the table that the perceptions of the respondents on LGBT when grouped according to Gender in Academic Performance do not have any significant difference because the p value is greater than the level of significance which is 0.05; therefore, we retain the null hypothesis.

This implies that the perceptions of the respondents of LGBT when grouped according to Gender in Academic Performance have the same level.

Table 6

Independent Sample T-Test: Comparison of Perceptions of the Respondents to LGBT when grouped according to Gender in Skills and Competencies

INDICATORS	Gender	Mean	F Value	P-Value	Decision	Remarks
Perception of Respondents on LGBT	Male	3.37	-0.79	0.43	Retain Ho	Not Significant
	Female	3.54				

Table 6 exhibits the significant difference between the perceptions of the respondents to LGBT when grouped according to Gender in Skills and Competencies. It was exposed by the table that the perceptions of the respondents on LGBT when grouped according to Gender in Skills and Competencies do not have any significant difference because the p value is greater than the level of significance which is 0.05; therefore, we retain the null hypothesis.

This implies that the perceptions of the respondents to LGBT when grouped according to Gender in Skills and Competencies have the same level.

Table 7

Independent Sample T-Test: Comparison of Perceptions of the Respondents to LGBT when grouped according to Gender in Attitude

INDICATORS	Gender	Mean	F Value	P-Value	Decision	Remarks
Perception of Respondents on LGBT	Male	3.30	0.87	0.39	Retain Ho	Not Significant
	Female	3.10				

Table 7 exhibits the significant difference between the perceptions of the respondents to LGBT when grouped according to Gender in Attitude. It was exposed by the table that the perceptions of the respondents on LGBT when grouped according to Gender in Attitude do not have any significant difference because the p value is greater than the level of significance which is 0.05; therefore, we retain the null hypothesis.

This implies that the perceptions of the respondents to LGBT when grouped according to Gender in Attitude have the same level.

Table 8

Independent Sample T-Test: Comparison of Perceptions of the Respondents to LGBT when grouped according to Gender in Behavior

INDICATORS	Gender	Mean	F Value	P-Value	Decision	Remarks
Perception of Respondents on LGBT	Male	3.48	-0.87	0.39	Retain Ho	Not Significant
	Female	3.68				

Table 8 exhibits the significant difference between the perceptions of the respondents to LGBT when grouped according to Gender in Behaviour. It was exposed by the table that the perceptions of the respondents on LGBT when grouped according to Gender in Behaviour do not have any significant difference because the p value is greater than the level of significance which is 0.05; therefore, we retain the null hypothesis.

This implies that the perceptions of the respondents of LGBT when grouped according to Gender in Behavior have the same level.

Table 9

Independent Sample T-Test: Comparison of Perceptions of the Respondents of LGBT when grouped according to Barangay in Academic Performance

INDICATORS	Barangay	Mean	F Value	P-Value	Decision	Remarks
Perception of Respondents on LGBT	Brgy. X	3.94	4.18	.00	Reject Ho	Significant
	Brgy. Y	3.11				

Table 9 exhibits the significant difference between the perceptions of the respondents of LGBT when grouped according to Barangay in Academic Performance. It was exposed by the table that the perceptions of the respondents on LGBT when grouped according to Barangay in Academic Performance have a significant difference because the p value is less than or equal to the level of significance which is 0.05; therefore, we reject the null hypothesis.

This implies that the perceptions of the respondents on LGBT when grouped according to Barangay in Academic Performance do not have the same level.

Table 10

Independent Sample T-Test: Comparison of Perceptions of the Respondents of LGBT when grouped according to Barangay in Skills and Competencies

INDICATORS	Barangay	Mean	F Value	P-Value	Decision	Remarks
Perception of Respondents on LGBT	Brgy. X	3.82	3.79	.00	Reject Ho	Significant
	Brgy. Y	3.16				

Table 10 exhibits the significant difference between the perceptions of the respondents on LGBT when grouped according to Barangay in Skills and Competencies. It was exposed by the table that the perceptions of the respondents on LGBT when grouped according to Barangay in Skills and Competencies have a significant difference because the p value is less than or equal to the level of significance which is 0.05; therefore, we reject the null hypothesis.

This implies that the perceptions of the respondents on LGBT when grouped according to Barangay in Skills and Competencies do not have the same level.

Table 11

Independent Sample T-Test: Comparison of Perceptions of the Respondents to LGBT when grouped according to Barangay in Attitude

INDICATORS	Barangay	Mean	F Value	P-Value	Decision	Remarks
Perception of Respondents on LGBT	Brgy. X	3.48	3.22	.00	Reject Ho	Significant
	Brgy. Y	2.84				

Table 11 exhibits the significant difference between the perceptions of the respondents to LGBT when grouped according to Year Level in Attitude. It was exposed by the table that the perceptions of the respondents on LGBT when grouped according to Year Level in Attitude have a significant difference because the p value is less than or equal to the level of significance which is 0.05; therefore, we reject the null hypothesis.

This implies that the perceptions of the respondents of LGBT when grouped according to Year Level in Attitude do not have the same level.

Table 12

Independent Sample T-Test: Comparison of Perceptions of the Respondents to LGBT when grouped according to Barangay in Behavior

INDICATORS	Barangay	Mean	F Value	P-Value	Decision	Remarks
Perception of Respondents on LGBT	Brgy. X	3.94	3.28	.00	Reject Ho	Significant
	Brgy. Y	3.29				

Table 12 exhibits the significant difference between the perceptions of the respondents of LGBT when grouped according to Year Level in Behaviour. It was exposed by the table that the perceptions of the respondents on LGBT when grouped according to Year Level in Behavior have a significant difference because the p value is less than or equal to the level of significance which is 0.05; therefore, we reject the null hypothesis.

This implies that the perceptions of the respondents to LGBT when grouped according to Year Level in Behaviour do not have the same level.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Findings

The analysis and interpretation of the perception of the respondents revealed the following:

1. Profile of the respondents in terms of:

1.1 Age

The data showed the profile of the respondents in terms of age. There is 1 or 1% of the respondent who belonged to age 16-18 years old, while 19- 21-year-old composed of 61 or 61% of the total population, age 22- 24 years old. Respondents were composed of 23 or 23%, while 25 years old and above is composed of fifteen (15) or 15% of the population.

1.2 Gender

As to gender, 30 or 30% of the respondents were to female while 70 or 70 % were male. Predominantly, majority of the respondents were male.

1.3 Barangays.

As to barangays, 50 or 50% of Brgy. X and Brgy. Y which is also 50 or 50% of the population.

2. The perception of the respondents to the LGBT in the community

2.1 Academic Performance

Respondents were very satisfied with the academic performance of LGBT as evidenced by the total weighted mean of 3.53.

2.2 Skills and competencies

Respondents were satisfied with the skills and competency of LGBT as evidenced by the total weighted mean of 3.49.

2.3 Attitude

The respondents were satisfied with the attitude of LGBT's as evidenced by the total weighted mean of 3.16.

2.4 Behavior

The respondents find the behavior of LGBT's as very satisfactory with the total weighted mean of 3.62.

3. The significant difference in the perception of respondents on LGBT's when group according to demographic profile.

3.1 Age

There is a significant difference between the respondents' age and their perceptions on LGBT's in terms of Academic performance.

There is no significant difference between the respondents' age and their perceptions on LGBT's in terms of Skills and competencies, Attitude and Behavior.

3.2 Gender

There is no significant difference between gender and the respondents' assessment on LGBT's.

3.3 Barangays

The result of this study showed that there is a significant difference between the respondent's barangays and their assessment on LGBT.

Conclusions

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

1. Most of the respondents were male. Majority of the respondents were 18-20 years old.

2. It appeared that the respondents were very satisfied on LGBT students' academic performance and behavior, while satisfied in skills and competencies and attitude of LGBT's.

3. There is a significant difference between the respondents' perceptions on LGBT's and respondents age in Academic performance.

There is no significant difference between the respondents' age in skills and competencies, attitude and behavior and their perceptions on LGBT's, and between the respondent's gender and barangay.

Recommendations

This study showed that the respondents were satisfied on LGBT's regarding its academic performance, skills and competency, attitude and behavior.

However, to further improve its functions, as derived from the findings and conclusions, the researchers came up with these recommendations:

1. Barangays in Manila should raise awareness and must be familiarized with LGBT issues.

2. They should practice and train more about LGBT performance and movement.

3. A similar study be conducted in other aspects and issues related to LGBT. Recommendations are as follows:

a. Michael R. Woodford, (2015). Academic and Social Integration on Campus Among Sexual Minority Students: The Impacts of Psychological and Experiential Campus Climate.

b. Human Rights Watch (2017). "Just Let Us Be" Discrimination against LGBT Students in the Philippines.

c. Kosciw, Gretak, Giga, Villenas, & Danischewski, 2016. From Awareness to Action: Teacher Attitude and Implementation of LGBT-Inclusive Curriculum in the English Language Arts Classroom.

BIBLIOGRAPHY

ONLINE SOURCES

Bradley, C. (2014). This thesis analyzes the journey of Ladlad, a political party in the Philippines specifically representing the country's LGBT citizens, from https://escholarship.org/uc/item/49v8j2wx

Cruz N., Garcia, J. (2013). Despite or precisely because of the fact that it is being increasingly globally invoked, the LGBT, from http://web.b.ebscohost.com/abstract?direct=true&profile=ehost&scope

Curinga, L. (2015). Professor receives first LGBT achievement award, from

http://news.psu.edu/story/355108/2015/04/29/academics/professor-receives-first-lgbt-achievement-award

Edgar, T.(2017). All should be safe places for everyone. But in the Philippines, from https://www.hrw.org/report/2017/06/21/just-let-us-be/discrimination-against-lgbt-students-philippines

Elder, G.(1995). The Life Course as Developmental Theory. Child Development, 69, 1-12, from http://www.academia.edu/27537716/The_Life_Course_as_Developmental_Theory

Elizabeth, (2015). Homosexuals finding more Acceptance. Poll says" states that gays and lesbians have experienced a dramatic rise, from https://ukessays.com

Franc, M. (2017)."Just Let Us Be" Discrimination Against LGBT Students in the Philippines, from

https://www.hrw.org/sites/default/files/report_pdf/philippineslgbt0617_web.pdf

Jagosh, J. (2015). "Moving toward understanding and acceptance: Parents' experiences after finding out their children are gay, lesbian, and bisexual, from https://www.ukessays.com/essays/sociology/acceptance-of-gays-and-lesbians-in-society-sociology-essay.php

Kosciw, Gretak, Giga, Villenas, & Danischewski,(2016). From Awareness to Action: Teacher Attitude and Implementation of LGBT-Inclusive Curriculum in the English Language Arts Classroom, from

http://journals.sagepub.com/doi/pdf/10.1177/2158244017739949

Lim, A. (2011). Protecting LGBT workers' rights City Ordinance No.1309,from https://www.awid.org/sites/default/files/atoms/files/changing_their_world_2_-_galang-_rights_of_poor_lbts_in_the_philippines.pdf

Maclang, K. (2015). 7 Inspiring Members of the Filipino LGBT Community, from

https://www.kalibrr.com/advice/2015/07/7-inspiring-members-of-the-filipino-lgbt-community

O'Angelli, A. (2015). The book overview of Lesbian, Gay and bisexual identities and youth, from https://.ukessays.com

Packhankis, J. (2017). Lesbian, gay, bisexual, and transgender (LGBT) individuals in Romania encounter pervasive stigma and discrimination, from

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5661855/

Underwood, E. (2014). Look up the code F66.0 in the International Classification of Diseases (ICD), from

https://www.ncbi.nlm.nih.gov/books/NBK361118/

UNDP, USAID (2014). BEING LGBT IN ASIA: THE PHILIPPINES COUNTRY REPORT, from https://pdf.usaid.gov/pdf_docs/PBAAA888.pdf

Woodford, M. (2015). Academic and Social Integration on Campus Among Sexual Minority Students: The Impacts of Psychological and Experiential Campus Climate, from

https://onlinelibrary.wiley.com/doi/full/10.1007/s10464-014-9683-x

THE IMPACT OF WORKING ARRANGEMENTS ON EMPLOYEES PERFORMANCE WORKS LIFE CONFLICT AND WORK PRESSURE IN EARIST

Marivic S. Guimary
Cynthia A. Manalad

I. INTRODUCTION

Work life balance is a very important phenomenon which is a great concern to various employees in both private and public sector. It goes beyond prioritizing the work role and one's personal life. It also affects the social, psychological, economical and mental well-being of the individual. All these have been reflected in the output of the individual, which affects his or her performance in the work place in the long run. Work arrangements have implication on employee's attitudes, behaviors, well-being as well as organizational effectiveness. Employees try their best to be retained in the organization by putting in more time at work which may be at detriment in their behavior and personal life.

Work is essentially "best practice". It is an agreed upon set of work procedures that establishes the most efficient, most reliable, and safest methods and sequences for each process and each worker. In a standard work environment everyone has clear roles and responsibilities. More importantly, people and machines are used to their fullest potential, and workloads are evenly spread out. For instance, work content required in each workstation on an assembly line should be outlined in detail, and cycle time should be as even as possible. This allows a better flow, and it places the same workload on each individual. If one operator has 5 minutes' worth of work in a workstation and another one has 3 and one half minutes of work is under loaded, depending on the flow requirements, the time of the flow person with 3 and one half minutes of work is not maximized, hence, the company is less productive.

1.1 Statement of the Problem

This study aimed to assess the selected employees of EARIST. Specifically, it sought to answer the following sub-problems:

1. What is the profile of the respondents in terms of:
   - 1.1. Age;
   - 1.2. Gender; and
   - 1.3. Marital Status?
2. How employees can handle the pressure and stress at work in terms of;
   - 2.1. Work Condition;
   - 2.2. Emotional Intelligence; and
   - 2.3. Productivity?
3. How do employees cope up with conflict in the workplace?

1.2 Significance of the Study

The following groups of people and organizations will be the primary beneficiaries of the study:

Employees. This would improve their behavior on working arrangements

School Administrators. This would monitor the impact of working arrangement of employees performance, works life conflict and work.

Future researchers. This would widen their knowledge about the impact of working arrangements on employees' performance, works life conflict, and work pressure.

II. Literature and Studies

The interaction between personal and professional lives is a topic that has been extensively studied in the last years. Research is mostly focused on spillover or enrichment between the two domains suggesting that feelings or behaviors in one domain affect behaviors or feelings in the other domain. The underlying premise, is therefore, the two domains are in conflict. This is based on role theory, which stipulates that responsibilities from different domains compete for a limited amount of time, energy and mental resources of an individual, which creates a role strain according to Greenhaus and Beutell, 1985. Through the perspective of role theory the work- family interface is seen as a continuum of conflict between work and family, ranging from little too much conflict, and that positive aspects of work and family reduce this conflict and its consequences. According to this theory, participation in one role is therefore more difficult because of participation in the other role. The literature suggests that there are two types of role strain associated with work- family conflict: overload, when the demands of time and energy of performing the two roles simultaneously are simply too great to handle, and interface when the demands of the two roles are conflicting to the extent that it is difficult to perform them both adequately. However, the literature also provides evidence for role enhancement theory, which takes a more positive stance to the work- family balance concept and is drawn upon that aspects from one role provide resources that the facilitate the other role, therefore that participation in one role enhances participation in the other and vice versa. This can, for example, happen when work is going well and the subsequent good mood spills over to the family sphere or when private life enjoyment helps employees to deal with the stress of work, therefore provide a sort of buffer according to Grzywacz and Marks, 2000; Thompson and Prottas, 2005; Voydanoff, 2002. The perception of conflict, balance or enhancement between work and family is then the result of weighing out the gains and demands of the work and family roles with the ultimate goal to achieve balance between the two roles. Pittman (1994) defined this balance as work- family fit in terms of social exchange theory (Blau,1964); that work- family balance can be conceived as acceptability of a multidimensional exchange between the two domains. It implies that a certain degree of comfort and satisfaction is achieved with the balance and exchange between the two spheres (Pittman, 1994; Voydanoff, 2002). Work-family life balance is then achieved when individuals perceive that they have reached a satisfactory resolution of the multiple demands of the work and family spheres. It is influenced by a variety of contextual factors such as type of work and household responsibilities (Higgins et al., 2000).

Jones (1991) suggested that situational characteristics might cause differences in individual's ethical decision-making processes. Jones "concept of moral intensity proposed that a person judges each situation on six factors (magnitude of consequences, probability of effect,

concentration of effect, temporal immediacy, proximity, and social consensus) when deciding whether to act ethically or unethically. For example, the legal system's sentence for petty larceny is far less severe than that for murder. Though both acts are essentially considered unethical and illegal, murder is viewed and punished more harshly. In this situation, society recognizes the moral intensity of murder to be much greater than petty larceny. Therefore, some people may choose to freely engage in petty larceny and may still feel that murder is an unethical act.

Each of the six dimensions of moral intensity describes a new situational concern. The magnitude of consequences refers to consideration of the costs associated with committing an unethical act. If these costs are low (i.e., low moral intensity), they are less likely to act unethically. Probability of effect concern the chances that negative consequences will occur (Jones). If the consequences are likely to happen, then the person may be more apt to proceed. Concentration of effect considers the number of people affected by these consequences (Jones). The more people affected, the less likely the person is to commit the unethical act.

Adverse consequences of long working hours can include individual effects such as sleep deprivation, health and work performance as well as effects on society, including family members and communities.

Teaching is often a stressful occupation, with demands from administrators, colleagues, students and parents compounded by work overload, shifting policies, and a lack of recognition for accomplishments. The outcomes of teachers' work-related stress are serious and may include burnout, depression, poor performance, absenteeism, low levels of job satisfaction, and eventually, the decision to leave the profession.

The Labor Code of the Philippines is the current law governing practices and labor relations in the Philippines. It is also identifies the Rules and Standards regarding employment policies, labor conditions, wage rate, work hours, employee benefits, termination of employees and so on. People working less than 40 hours per week, cover 57% while the rest is made up by the invisible underemployed people those who work over 40 hours per week but wants more hours.

On 1991, Josephine Tuble of the University of Santo Tomas Graduate School made a study that the level of productivity is correlated with job satisfaction with regards to the nature of work, supervision, co-workers relationship and pay aspect.

III. METHODOLOGY

This study presents the impact of working arrangements on employees performance, works life conflict and work pressure in EARIST.

In this research, it used a descriptive design. Descriptive research refers to the type of research question, design, and data analysis that will be applied to a given topic. Descriptive statistics tell what is, while inferential statistics try to determine causes and effects. Descriptive research can be either quantitative or qualitative. It can involve collection of quantitative information that can be tabulated along continuum in numerical form, such as scores on a test or the number of times a person chooses to use a certain feature of a multi-media program, or it can describe categories of information such as gender or patterns of interaction when using technology in a group situation.

IV. RESULTS AND DISCUSSIONS

Table 1

Assessment of the Respondents on Work Condition

Criteria	WM	VI	Rank
1. How often have you found yourself stressful at work?	3.42	Sometimes	2
2. How often have you had physical problems or pain because of work?	2.86	Sometimes	3
3. How often have you felt so tired from work that you were unable to enjoy the things you like to do outside of work?	3.6	Often	1
Overall Mean	**3.29**	**Sometimes**	

As presented from Table 1, the respondents assessed item 3 which "how often have you felt so tired from work that you were unable to enjoy the things you like to do outside of work" as often supported by the mean of 3.6, rank 1; item 1 which is "how often have you found yourself stressful at work" as sometimes supported by the mean of 3.42, rank 2; item 2 which is "how often have you had physical problems or pain because of work" as sometimes supported by the mean of 2.86, rank 3; respectively.

Table 2

Assessment of the Respondents on Emotional Intelligence

Criteria	WM	VI	Rank
1. Know how own feeling impact to own performance	3.42	Sometimes	2
2. Behave calmly in stressful situation	2.86	Sometimes	3
3. Express own feeling	3.6	Often	1
Overall Mean	**3.29**	**Sometimes**	

As presented from Table 2, the respondents assessed item 3 which is "express own feeling" as often supported by the mean of 4.58, rank 1; item 2 which "behave calmly in stressful situation" as often supported by the mean of 4.48, rank 2; item 1 which is "know how own feeling impact to own performance" as often supported by the mean of 4.14, rank 3, respectively.

Table 3

Assessment of the Respondents on Productivity

Criteria	WM	VI	Rank
1. Long hours make you more productive	4.56	Always	1
2. Working hours causes any difficulties	3.34	Sometimes	3
3. Prefer to work a different times of the day than you usually work	3.94	Often	2
Overall Mean	**3.95**	**Often**	

As presented from Table 3, the respondents assessed item 1 which is "long hours make you more productive" as always supported by the mean of 4.56, rank 1; item 3 which is "prefer to work a different times of the day than you usually work" as often supported by the mean of 3.9, rank 2; item 2 which is "working hours causes any difficulties" as sometimes supported by the mean of 3.34, rank 3, respectively.

Generally impressions on the variables presented on how professors can handle the pressure and stress at work in terms on the productivity as often supported by the overall mean value of 3.95.

Table 4

Assessment of the Respondents on how Professors Cope up with Conflict in the Workplace

Criteria	WM	VI	Rank
1. View conflict as opportunity	4.72	Always	4
2. Focus on behavior and events not on personalities	4.48	Often	5
3. Listen to what the other person is saying instead of getting ready to react	4.76	Often	3
4. Ask questions to clarify your understanding	5	Always	1
5. Develop a plan to work on each other	4.88	Always	2
Overall Mean	**4.77**	**Always**	

As presented from Table 4, the respondents assessed item 4 which is "Ask questions to clarify your understanding" as always supported by the mean of 5.00, rank 1; item 5 which is "develop a plan to work on each other" as always supported by the mean of 4.48, rank 2; item 3 which is "listen to what the other person is saying instead of getting ready to react" as often supported by the mean of 4.76, rank 3; item 1 which is "view conflict as opportunity" as often supported by the mean of 4.72, rank 4; item 2 which is "focus on behavior and events not on personalities" as often supported by the mean of 4.00, rank 5, respectively.

Generally, impressions of all the variables presented how professors cope up with conflict in the workplace as always supported by the overall mean value of 4.77.

V. FINDINGS

The following are the findings of the specific problems raised in the study:

1. In terms of work conditions, impressions on the variables presented on how employees can handle the pressure and stress at work as "sometimes" supported by the overall mean value of 3.29.

2. In terms of emotional intelligence, impressions on the variables presented on how employees can handle the pressure and stress at work as "often" supported by the overall mean value of 4.40.

3. In terms of productivity, impressions on the variables presented on how employees can handle the pressure and stress at work as "often" supported by the overall mean value of 3.95.

4. The findings on how the employees cope up with conflict in the workplace, impressions on the variables presented how professors cope up with conflict in the workplace as "always" supported by the overall mean value of 4.77.

VI. CONCLUSIONS

Based on the findings, the researchers concluded that:

1. Employees were often tired being at work that they were unable to enjoy the things they like to do outside of work; and sometimes found themselves being at work stressful and had physical problems or pain at work.

2. Employees were often express their own feeling; and often calm in a stressful situation and know how own feelings impact on their performance.

3. Employees always make long hours more productive; they prefer to work at different times of the day than they usually work as often; and they often causes any difficulties on working hours.

4. Employees always asked questions to clarify their understanding; they were always develop a plan to work on each other; they often listen to what the other person is saying instead of getting ready to react; and often viewed conflicts as opportunity and focus on behavior and events not on personalities.

VII. BIBLIOGRAPHY

Brass, D., Butterfield, K., & Skaggs, B. (1998). Relationships and unethical behavior: A social network perspective. Academy of Management Review, 23 (1), 14-31. doi:10.2307/259097

Fapohunda, T. M. (2014) An exploration of the effects of work life balance on productivity. Journal of Human Resource Management and Labour Studies, 2(2) 71-89

Fine, S., Horowitz, I., Wiegler, H., & Basis, L. (2010). Is good character good enough? The effects of situational variables on the relationship between integrity and counterproductive work behaviors. Human Resource Management, 20(1), 73-84

Golden, L. (2012). The effects of working time on productivity and firm performance. A Research Synthesis Paper: International Labour Organization, Geneva.

M & Hussain, A. (2013) Impact of Work Life balance on Employees Performance an Empirical Study on Seven Apparel Organization on Sri Lanka.

TRANSNATIONAL EDUCATION (TNE): KEY TO THE INTERNATIONALIZATION OF HUMAN RESOURCES AND MANAGEMENT OF SKILLED MIGRANTS

Dr. Lourdes P. Jusay

INTRODUCTION

The advent of globalization, liberalization of trade in goods and services and rapid changes in information and communication technology need an education to be responsive to its demands where the clientele must go beyond the bounds of its parameters in acquiring relevant knowledge and skills. It calls for a dynamic policy to address the global mobilitiy of the people who are wanting to participate actively in such endeavor. Education, therefore, is the key to the internationalization of human resources where the government plays a vital role to help the individuals keep abreast with the fast paced life of today's generation.

Transnational Education (TNE) was envisioned by the Commission of Education (CHED) with the end view to internationalize Philippine higher education to assist in the fast growing development of a human resource. TNE refers to higher education that is delivered in a country other than the one where an awarding institution is based. This is the country's response to the dire need of the mobile manpower reources nowadays.

TNE means a higher education delivered in a country other than the one where an awarding institution is based. Categories of TNE programs are as follows: Inbound TNE Programs which refer to higher education programs operating in the Philippines; Outbound TNE Programs refers to higher education programs operating outside of the Philippines; TNE Onshore refers to the country where a higher education provider has its base of operations; and TNE Offshore refers to any locality outside of the country where a higher education provider has its base of operations.

All universities intending to offer quality education to their students, whether in the Philippines or abroad, are required to undergo accreditation or certification for their programs to be offered. Further, they are mandated to register and get the necessary approval to operate their TNE programs where they will be given authority to operate and the duration of the authority given to them from the Commission on Higher Education (CHED).

Private higher education institutions (PHEIs) granted autonomous and reregulated status by CHED including all campuses of the University of the Philippines need ot secure government authorization to operate TNE programs to ensure quality standards. However, they need to submit the necessary reports, data or information regarding the implementation and operation of TNE programs to the CHED-Office of Programs and Standards Development (OPSD) through their respective Regional Offices (CHEDROs).

TNE programs are not limited to educational services such as curriculum planning; curriculum development; syllabi development; instructional materials design and development; mentoring, lecturing, tutoring, facilitating, discussion, academic counseling; developing assessment methods/instruments; student evaluation; course/program evaluation; and others.

TNE, likewise, offers auxiliary services such as promotional activities, recruitment, testing, admission, registration, processing of payments, student orientation, providing access to communication technologies, proctoring examinations, and others.

After graduation from their respective program of education, students join the world of work. It is in this light that the they will be able to apply the learning and insights that they got from their institution making them viable partners in the attainment of their company's vision, mission, and goals.

Hence, TNE plays an important role in the internationalization of human resources and management of skilled migrants. They are not only professionals in their field of endeavor but they become experts in their area of specialization. Moreover, they are equipped with the basic knowledge, skills and values that a professional in their field should possess.

The study aimed to determine the level of awareness of the respondents about TNE and its impact to internationalization of human resources and management of skilled migrants. Specifically, the study sought to answer the following questions: 1. What is the level of awareness of the respondents about TNE in terms of: the programs; accessibility; and assessment and evaluation? 2. What is the level of student engagement in TNE in terms of the following: cognitive; behavioral, and affective? Is there a significant relationship between awareness and the student engagement in TNE?

The study was anchored on the theory of Astin (2008) on student engagement. Student engagement is defined as "participation in educationally effective practices, both inside and outside the classroom which leads to a range of measurable outcomes. (Kuh, et. Al. 2007). Moreover, it refers to the extent to which students are engaged in activities which higher education research has shown to be linked with high-quality learning outcomes.

Student engagement means the involvement of the student to the academically purposeful activities that contribute directly to desired outcomes. This kind of involvement provides students the eagerness to finish their education and become members of the workforce in the future. Thus, a strong workforce would make a nation strong because it results to productive nation.

Astin's theory postulated that student engagement provides the necessary information as to how student perceives the importance of his education in his life. He endeavors to maximize his knowledge about it with the end result that he could use it in his future employments. He does not only think of employment in the country. But, he desires to work abroad in order to become an economic man who is paid corresponding to his qualification. Thus, he becomes an internationalized migrant who works beyond the boundaries of his country.

Curriculum planners are assisted with such information. They are provided with the data that will enable them to craft curriculum which is encompassing where technological advancements are integrated. In this case, TNE was introduced to address the strong desire of the students who matriculate in different programs offered by the service providers located in their country and in other places.

The study hypothesized that there is no significant relationship between the level of awareness and the student engagement in TNE.

Studies and researches were surveyed along the area of TNE. McGuire, Scott, and Shaw (2010) said that the use of information and communication technologies, including the internet, on campus and in distance education is ubiquitous. E-learning (that is, technology used by instructors to support the learning process), including powerpoint presentations in class, web-based discussions to further in – class dialogue, and the full range of information

and communication technologies which faculty may use when teaching the subject entirely in the classroom, entirely online, or the combination of both.

Junco, Helbergert and Loken (2011) stated that media and internet-based tools that promote collaboration and information sharing can be used in academic settings to enhance student engagement and facilitate better student learning. It was found out that student engagement represents the time and effort that the learners invest in collaborative and educational activities. (Kuh, 2011). Further, student engagement is positively correlated with the achcievement of the student learning outcomes such as critical thinking and individual student development.

In sum, technologies such as social media which includes web-based tools and services are designed to promote academic excellence through collaboration and information sharing.

Academic assessments include the long examinations, exercises, projects, quizzes and other related activities in the school or university. In the TNE programs, these are done through technology. They are given by the faculty through email and students send back their answers to the faculty the way they were sent to them.

Feedback, on the other hand, provides information to the students about their performance. It is important that feedback should be closed to the task that was given to the student so that he can relate it to his performance. Thus, if the student is to benefit maximally from the feedback they must be able to relate it to the logic they employed in generating their response. (Colis, De Boar and Slotman, 2008).

Higher education institutions have been challenged by major changes in their various settings. Students enrolled in HEIs grew up and used internet and other digital technologies. As such, their behaviors are influenced by these technologies. They expected that educational practitioners and developers recognize these changes and designed educational offerings appropriate for their learning patterns, characterisitcs and behaviors. Student's perception and satisfaction with online learning and distance learning have drawn attention from them. Technology is changing the way people, company and institutions disseminate, communicate, creating ubiquitous learnining environment.

According to Lieberman (2012), students enrolled in any elearning courses or distance learning perform better than those in traditional programs. He stated that student's engagement in elearning and distance learning is more likely to participate in class sessions and group work because he is given more time to prepare his answers.

RESULTS AND DISCUSSION

The study found out that TNE programs were found to be increasingly known to the students. It used to be known by other names such as elearning and distance learning or distance education. However, as found in the study that it was "moderately Agree" when respondents were asked as to the existence of the such programs with the overall weighted mean of 3.04.

McGuire, Scot and Shaw (2010) said that communication technologies are proliferating everywhere. Education is not exempted. It has been influenced by this technology. Inevitably, students became experimenting in their studies as to where they can get data for their studies. It is in this line that TNE was offered in order to address the needs of those students wanting

very much to become learned individuals with their chosen school or university. Although they are in their own country, they could enjoy enrolling in the university of their own choice. This can be called virtual education where education is given by the faculty from the country of his origin to his student in another country. Distance is not a problem in today's generation because of the technology that can be maximized in order to lessen the expenses incurred in getting quality education.

As to TNE accessibility, the study found out that TNE is accessiible to the students. They rated all the criteria as "moderately Agree". The respondents were in unison as to their assessment of TNE accessibility. They found TNE as an avenue for faster communication in acquiring knowledge. Moreover, they found the program as a means of enjoying their freedom to participate through a different medium of instruction. With this, they became productive members because they were given enough time to think of their answers for better understanding of his or her position in a given subject matter. They saw TNE which deepens their collaborative efforts despite their individual distance to their colleagues who were also enrolled in the same program with different nationalities and background to consider.

With regards to the assessment and evaluation of TNE, respondents assessed the evaluation of the TNE programs as "Moderately Agree". This meant that respondents were confident that, like in the traditional school on education, TNE has a system in evaluating the student's performance enrolled in the different programs that it offered. Thus, it did not differ with the type of system that they knew in the traditional school. They were guaranteed that although they were enrolled in the TNE, they were assured of the quality education that they can get from the said programs.

Student Engagement in TNE was found to be moderately agree with the cognitive aspect of the respondents. They found the programs as helpful in their quest for knowledge with facility because they can manage their time in their studies especially when they are working students.. Further, with the TNE programs, respondents can go over the course materials when they are free to have a better understanding of the subject matter. They, too, enjoyed the tasks and activities provided to them by the programs where, most of the times, they can do them at their convenient time.

Furthermore, respondents rated TNE in terms of behavior which garnered an overall weighted mean of 2.90 interpreted as "Moderately Agree". This means that students are participative in their academic work and assignments. They were focused and found the activities interesting. As a consequence, they were able to monitor their own progress and development. They, therefore, became mindful of their status as student although they did not have active life in TNE, when they went online, they found themselves engrossed with the different activities given to them.

TNE in terms of the affective aspect of the respondents obtained an overall weighted mean of 3.04 interpreted as "Moderately Agree." Respondents' assessment gave an impression that they were happy with the existence of TNE programs. They were delighted with the academic freedom that they had which made them interactive with the activities that were given to them. Further, they found TNE programs met their expectations because they would finish their education without painstakingly attending the class on a regular basis. Thus, they welcomed TNE programs as a medium in getting quality education in the university of their own choice.

Summarily, the respondents viewed the signifcant relationship of TNE and student engagement with the computed t values of 7.02, 5.63 and 6.48 which were higher than the tabular value of 1.960. Thus, the hypothesis was rejected. This implies that there is a significant relationship between the TNE programs and student engagement.

The findings were supported by Volery (2010) where he mentioned that networked learning environments modify the courses as they go along, hence, the longer a course is taught in particular scheme, the more effective it becomes. Scott (2010) found out that in elearning environments, lecturers or professors offer constant educational support because students could go over their notes, visit websites and view course materials regardless of their time and location. (McClleland, 2011).

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of the study, the following are hereby forwarded: that TNE programs are starting to proliferate in the country, accessible to the respondents, and has a system on evaluating the student's performance. Student's engagement in terms of cognitive, behavior, and affective are properly addressed by the TNE programs for their full development as migrant workers in human resources.

It is, therefore, recommended that TNE which is a new education paradigm, be widely disseminated for the information of the students who wanted to access its programs thereby making an impact in the competencies that they needed to develop in the university or school of their own choice. This will redound to their professional skills when they become migrant workers abroad as a result of the globalization. Summarily, TNE plays an important role in the internalization of human resources and management of migrant workers because they will bring into their workplace the knowledge, values and skills that they learned from the programs.. Moreover, with the advanced technologies which are prevailing in the present generation, migrant workers will be able to adjust well in their work environment where they belong. This will result to their high work performance. It is deduced, therefore, that education continues to influence human resources especially the TNE programs which will liberalize the workforce in the performance of their duties and functions.

REFERENCES

A. BOOKS

Barbara Means U.S. Department of Education Office of Planning Evaluation and Policy And Program Studies Sevice. 2010.

Barbour and Reeves. Effeectiveness of K-12 Online Learning. State University of New York at Albany. 2009.

Del Rosario. Technology Integration in Teacher Education Programs in the Philippines. 2007.

Fredericks, J. McColskey. W. , Meli, J. Mordica, J., Montrosse B., and Mooney, K. Measuring Student Engagement in Upper Elementary Through High School: A Description of 21 Insturments. (Issues and Answer Report, REL 2011-No. 098). Washington, DC: US Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistant, Regional Educational Laboratory Southeast Retrieved from http://ies.ed.gov/ncee/edlabs

McDermott. Implementation and Management of the Blended learning Programs at University of the East, Philippines. University of the Est. Philippines. 2010.

Moralina. Response Theories for Teaching World Literature of Technical Students in the Tertiary Level. Far Eastern University – East Asia College. 2010.

Natera. The Shift from Face to Face to Blended Learning in Philippine Secondary School, Quezon City, Philippines. 2013.

Siegler. The Rebirth of Children's Learning. State University of New York at Albany. 2008.

Singh. O"Donoghue, and Worton. A Study into the Effects of E-Learning On Higher Education. University of Wolverhampton. 2005.

Tan. Collaborative and sustainable Learning. Far Easter University – East Asia College. 2011.

B. ARTICLES

Apsden and Helm. Making the Connection in a Blended Learning and Learning Environment. Education Mediat International. 2004.

Chapman, Laird and Kewalramani. Trends in High School Dropoint and Completion Rates In United States. University of Alberta. 2011.

Chen et al. A Framework for Student Engagement in Social Networking Site. University Technology. Malaysia 2010.

Engstrom, alexander Astron and Heiberger and Harper, et.al. Current Issue in Education, Biological Science University. Toronto, Canada. 2012.

Heiborger, Greg and Harper, Ruth. Student Engagement Theory. New Direction for Student Service No. 124 Wintrer. Arizona State University.

Harris, Wilms, Fiesen, and Milton. Improving Student Engagement. Current Issues in Education. University of alberta. 2011.

Heiberg and Harper, Aston. Have You Facebook Lately Using Technology to Increase Student Involvement. Department of Counseling. Clinical and Social Psychology. Santa Barbara. California. University of California.

Martinez, and Castillo. Investing in E-Learning Future. Philippine Daily Inquirer. 2011.

Obliger and Hawkins. ICT in Teaching and Learning. Combining Theory with Experience In Albanian Universities. Albanian Institute of Research and Education in Information Technology. 2005.

Ong and Lai and Welsh, et. Al. Taiwan Australasian Journal of Educational Technology. National Central University. 2014.

C. JOURNALS

Arimbuyutan, Kim, song and So. A Study of E-Learning for Philippines. International Journal of Multimedia and Ubiquitous engineering. Vol. 2. 2007.

Azizan. Blended Learning or E-Learning. Faculty of Education. University Teknologi. Malaysia. Johor Bahru. Malaysia. 2010.

Cavenaugh, et al. A comparison of E-Learning and Traditional Classroom Teaching. Petra University. 2008.

Cavenaugh, et al. Research and Practice in K-12 Online Learning. State University of York at Albany.

Claxton and Ralston. Learning and Teaching Styles. Eastern Illinois University. 2011.

Corbett and Smith. Learning and Teaching Styles. Universities in South Carolina. 2010.

Cross. Learning and Teaching Styles. University of Idaho. United States./ 2010.

Oliva. Information Communication Technology in Learning. Colombo Plan Staff College For Technical Education.

Filipova. The Psychology of E-Learning: a Field Study. J. Educational Computing Research. State University of New York at Albany. Vol. 29 (3). 2008.

Hus. Environmental Science and Educationare Sufficient Knowledge. Education Faciclity. Philippines. 2011.

Loxley. Information Communication Technology. Colombo Plan Staff College for Technician Education. 2011.

Rodrigo. Metro Manila Schools. Information and Communication Technology Formulated Institute. Philippines. 2005.

Wong. Student Engagement With Online Resources and Its Impact on Learning Outcomes. Journal of Information Technology Education: Volunme 12. 2013. Victoria University, Melbourne, Australia.

Yap. Sector Garnered 20% of the Asia's Top IT – Using Institution. University of the Philippines. Diliman. Quezon City. Philippines. 2005.

Zhao and Breslow. Literature Review on Hybrid/Blended Learning. Teaching and Laboratory, Ohio State University.

FERTILITY DANCE FESTIVAL IN OBANDO, BULACAN: INPUTS TO CULTURE PRESERVATION MODEL

Dr. Romeo D. Lim

1. Background

Traditions are an integral part of any culture and for us Filipinos, a tradition is something we follow and pass on to the younger generation. The rituals and/or rites of passage are as staple as our love for adobo (Liwanag-Bledsoe, 2013). Our constitution says that "the State shall conserve, promote, and popularize the nation historical and cultural heritage and resources, as well as artistic creation" (Section 15, Article XIV). For a start we could actualize this mandate by enacting laws or ordinances requiring the airing of our folk dances in regular radio and TV programs (Sison, 2002).

This study aimed to evaluate in preserving the traditional fertility rites, Dance Festival in Obando, Bulacan as a Tourist Attraction. Explicitly it sought answer to the following sub question: How do the respondents assess the Fertility Dance Festival in Obando, Bulacan in terms of: Faith, Belief, Culture, Tradition, Dance, and Music. Is there a significant difference in the assessment of the respondents when devotees are group according to local or tourists? What are the problems encountered by the respondents. From the findings of the study, what culture preservation inputs may be proposed?

2. Methods

This study used the descriptive type of research using the survey methods. Descriptive research method is fact-finding study with adequate and accurate interpretation of the finding. The characteristics used to describe the situation or a population is usually some kind of categorical scheme also known as descriptive categories. (Cornell, Mendoza, and Bolotaolo, 2014). On the other hand defines descriptive research as involving collection of data in order to test hypothesis or to answer questions concerning the current status of the subject of the study. The main research instrument was the researcher made questionnaire subsided by interviews and observation made by the researchers. The respondents of the study were residents of Obando, Bulacan and local tourist. The respondents were from the different status and educational attainment. The respondents of the study were composed of fifty(50) respondents, twenty five (25) selected Day Tourists and twenty five (25) selected local Tourist. The researchers used the survey questionnaire to get the outlook of the respondents about the festival. The sampling use in the study is Purposive Sampling. The data gathered by using some instrument in research used: Interview, Observation, and Survey Questionnaire. The data gathered are complied, collated and summarized separately per group. The responses for each item were categorized separately per group. The responses for each item are categorized base on the specific problems raised. The following is utilized in the treatment of the data: Frequency, Percentage, Weighted Mean, and t-test.

3. Results

3.1 Formula and Equations

The study utilized the following statistical data:

3.1.1 Frequency. It was the actual responses to a specific items/question in the questionnaire where the respondent picks a choice.

Formula:

X-fx/n

3.1.2 Percentage. This was used as descriptive statistics of something that describe a part of a whole.

Formula:

% = f/N x 100

Where:

% = percentage
f = frequency
N = total no. of respondents

3.1.3 Weighted Mean. This was used to measure the respondents' assessments. Each value in the group was multiplied by the appropriate weight factor it does and the product is summed and divided by the total number of respondents.

Formula:

$$WM = \frac{(f_5 x5) + (f_4 x5) + (f_3 x5) + (f_2 x5) + (f_1 x5)}{N}$$

Shown below is the Likert-scale used in evaluating the part two of the questionnaire.

Scale	Remarks	Range
5	Always Practice (AP)	4.20 - 5.00
4	Practice (P)	3.40 - 4.19
3	Occasionally Practice (OP)	2.60 - 3.39
2	Rarely Practice (RP)	1.80 - 2.59
1	Never Practice (NP)	1.00 - 1.79

3.1.4 t-Test. This was used to determine whether or not the significance existed between the perception of the local tourist and the foreign tourist respondents. It is solved using the formula.

The following formula help compute the t-test:

Formula:

$$M = \frac{\sum(x)}{N}$$

Where:
M = the arithmetic mean
∑x = sum of the scores
N = No. of scores

a. Standard Deviation Formula:

$$\mathbf{SD} = \sqrt{\frac{\sum \mathbf{d2}}{\mathbf{N}}}$$

SD= Standard Deviation
∑d2= Sum of the difference in the variance squared (x-x)2

b. In variance squared (x-x)

The **formula** for t-test is

$$\mathbf{t} = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Where:

X_1 – mean of the first group
X_2 – mean of the second group
S_1 – variance of the first group
S_2 – variance of the second group
N_1 – number of students in the first group
N_2 – number of students in the second group

3.2 Figures and Tables

Table 1: Respondents of the Study

		Number of respondents (NR)	Percentage of NR to number of TR
Respondents	Day Tour Visitors	25	50%
	Local Tourists	25	50%
Age	21 – 25 years old	4	8%
	26-30 years old	4	8%
	31-35 years old	5	10%
	36-40 years old	13	26%
	41-45 years old	16	32%
	46 years old above	8	16%
Educational Attainment	College Undergraduate	9	18%
	College Graduate	25	50%
	MA/MBA/MS/Ed.d/PhD/DBA	4	8%
	Others	12	24%
Salary	Php 5,000 and Below	1	2%
	Php 5,001 – 10,000	13	26%
	Php 10,001 – 20,000	16	32%
	Php 20,001 – 30,000	11	22%
	Php 30,001 – 40,000	9	18%

Sub-Problem No. 1. How do the respondents assess the fertility dance festival in Bulacan in terms of:

Table 2: Assessment of the Respondents on the Fertility Dance Festival in Bulacan.

Criteria	Day Visitors			Local Tourists			Total		
	VM	VI	R	VM	VI	R	VM	VI	R
1.1 Faith	3.48	P	3	4.40	AP	1	3.94	P	1
1.2 Belief	3.43	P	4	4.31	AP	2	3.87	P	2
1.3 Culture	3.55	P	2	4.17	P	3	3.79	P	4
1.4 Tradition	3.63	P	1	4.03	P	4	3.83	P	3
1.5 Dance	3.29	OP	5	3.84	P	5	3.56	P	5
1.6 Music	3.23	OP	6	3.60	P	6	3.41	P	6
Overall Composite Mean Value	**3.44**	**P**		**4.06**	**P**		**3.73**	**P**	

Legend: 4.20 - 5.00 = Always Practice; 3.40 - 4.19 = Practice; 2.60 - 3.39 = Occasionally Practice; 1.80 - 2.59 = Rarely Practice; 1.00 – 1.79 = Never Practice

As shown in Table 2 indicating the assessment of the respondents on the fertility dance festival in Bulacan. As indicated in the table, Day Visitors rank no. 1 is Tradition with the composite mean value of 3.63 verbally interpreted as “Practiced”. Rank no. 2 is Culture with the composite mean value of 3.55 verbally interpreted as “Practiced”. Rank no. 3 is Faith with the composite mean value of 3.48 verbally interpreted “Practiced”. Rank no. 4 is Belief with the composite mean value of 3.43 verbally interpreted as “Practiced”. Rank no. 5 is Dance with the composite mean value of 3.29 verbally interpreted as “Occasionally Practiced”. And rank no. 6 is Music with the composite mean value of 3.23 verbally interpreted as “Occasionally Practiced”. With the overall composite mean value of 3.44 verbally interpreted as “Practiced.

As regards to local tourists, rank no. 1 is Faith with the composite mean value of 4.40 verbally interpreted as “Always Practiced”. Rank no. 2 is Belief with the composite mean value of 4.31 verbally interpreted as “Always Practiced”. Rank no. 3 is Culture with the composite mean value of 4.17 verbally interpreted “Practiced”. Rank no. 4 is Tradition with the composite mean value of 4.03 verbally interpreted as “Practiced”. Rank no. 5 is Dance with the composite mean value of 3.84 verbally interpreted as “Practiced”. And rank no. 6 is Music with the composite mean value of 3.60 verbally interpreted as “Practiced”. With the overall composite mean value of 4.06 verbally interpreted as “Practiced”

For the total, rank no. 1 is Faith with the composite mean value of 3.94 verbally interpreted as “Practiced”. Rank no. 2 is Belief with the composite mean value of 3.87 verbally interpreted as “Practiced”. Rank no. 3 is Tradition with the composite mean value of 3.83 verbally interpreted “Practiced”. Rank no. 4 is Culture with the composite mean value of 3.79 verbally interpreted as “Practiced”. Rank no. 5 is Dance with the composite mean value of 3.56 verbally interpreted as “Practiced”. And rank no. 6 is Music with the composite mean value of 3.41 verbally interpreted as “Practiced”. With the overall composite mean value of 3.73 verbally interpreted as “Practiced”.

Sub-Problem no. 2 Is there a significant difference in the evaluation of the two groups of respondents as to the assessment of the Dance Fertility Festival.

Table 3: Result of t-test on the Assessment of the Respondents in the Fertility Dance Festival in Bulacan.

Criteria	Day Visitors		Local Tourists		t-computed value	Interpretation	Decision
	WM	SD	WM	SD			
1.1 Dance	3.29	.188	3.84	.144	11.70	Significant	Reject HO
1.2 Belief	3.55	.054	4.17	.082	31	Significant	Reject HO
1.3 Tradition	3.48	.090	4.40	.136	27.88	Significant	Reject HO
1.4 Culture	3.63	.086	4.03	.059	19.05	Significant	Reject HO
1.5 Music	3.23	.125	3.60	.193	8.04	Significant	Reject HO
1.6 Faith	3.43	.071	4.31	.013	62.86	Significant	Reject HO

As presented in Table 3, it reveals the result of t-test in the significant difference on the assessment in the fertility dance festival in Bulacan As revealed in the table, all criteria were found to have significant differences in the assessment on the fertility dance festival which leads to the rejection of the null hypotheses.

Wherein, Faith got the highest t-computed value of 62.86; followed by Belief with 31; next is Tradition which got 27.88; the Culture had 19.05; and Dance got 11.70; lastly, Music got 8.04 which were all greater than its t-critical value of 1.679 at .05 level of significance.

Sub-Problem No. 3 What are the problems encountered by the respondents.

Table 4: Problems Encountered by the Respondents

Problems Encountered	Day Visitors		Local Tourists		Total		Rank
	f	%	f	%	f	%	
1. Only few accommodations at Obando, Bulacan.	8	32	6	24	14	28	1
2. First Aid Personnel were stationed far from each unit.	3	12	4	16	7	14	4
3. Overcrowding during the Ceremony or the Fertility Dance Parade	4	16	5	20	9	18	3
4. Non presence of crowd management group to handle the crowd	2	8	3	12	5	10	5
5. Some of the food establishments are closed.	2	8	2	8	4	8	6
6. Streets of the Parade Route were open for small vehicles, thereby causing traffic.	6	24	5	20	11	22	2

As revealed in Table 4, there are problems being encountered by the day visitors as to the Fertility Dance Festival in Obando, Bulacan namely, Only few accommodations at Obando, Bulacan with a total frequency of 8 or 32 percent; First Aid Personnel were stationed far from each unit with a total frequency of 3 or 12 percent; Overcrowding during the Ceremony or the Fertility Dance Parade with a total frequency of 4 or 16 percent; Non presence of crowd management group to handle the crowd with a total frequency of 2 or 8 percent; Some of the food establishments are closed with a total frequency of 2 or 8 percent; Streets of the Parade Route were open for small vehicles, thereby causing traffic with a total frequency of 6 or 24 percent.

As regards to local tourists, Only few accommodations at Obando, Bulacan with a total frequency of 6 or 24 percent; First Aid Personnel were stationed far from each unit with a total frequency of 4 or 16 percent; Overcrowding during the Ceremony or the Fertility Dance Parade with a total frequency of 5 or 20 percent; Non presence of crowd management group to handle the crowd with a total frequency of 3 or 12 percent; Some of the food establishments are closed with a total frequency of 2 or 8 percent; Streets of the Parade Route were open for small vehicles, thereby causing traffic with a total frequency of 5 or 20 percent.

For the total, Rank no. 1 is Only few accommodations at Obando, Bulacan with a total frequency of 14 or 28 percent; rank no. 2 Streets of the Parade Route were open for small vehicles, thereby causing traffic with a total frequency of 11 or 22 percent; rank no. 3 Overcrowding during the Ceremony or the Fertility Dance Parade with a total frequency of 9 or 18 percent; First Aid Personnel were stationed far from each unit with a total frequency of 7 or 14 percent; Non presence of crowd management group to handle the crowd with a total frequency of 5 or 10 percent; Some of the food establishments are closed with a total frequency of 4 or 8 percent.

Sub-Problem No. 4 From the findings of the study, what culture preservation inputs may be proposed.

Local Government Unit should provide the bed and breakfast accommodation to be offered by the residents. First aid personnel should be stationed in every corner of the parade route. There should be enough local personnel assigned to handle the crowd to avoid overcrowding or a crowd management, training must be given to Local Government Unit people. Local Government Unit may consider having a dialogue with the local food business owners to open during the parade. Local Government Unit must implement closing of the roads used during the parade.

3.3 Acknowledgement and Legal Responsibility

The researcher would like to give his sincerest appreciation to the administration of Eulogio “Amang” Rodriguez Institute of Science and Technology for the financial support all throughout the process in making the research. To my colleagues and also to Dr. Celia E. Carino whom they share their ideas without hesitation in making this paper possible and to my family and friends for their untiring support, love, understanding and concern given to them.

This document and information in it are provided in confidence for the sole purpose of exploring research opportunities between the disclosing party and the receiving party concerning (Fertility Dance Festival in Obando, Bulacan: Inputs to Culture Preservation Model), and may not be disclosed to any third party or used for any other purpose without the writer permission of the disclosing party

4. References

Cornell, G. B., Mendoza, E. C., and Bolotaolo, R. A. (2014). Fundamentals of research and thesis writing. Manila: Mutya Publishing Home, Inc.

Liwanag-Bledsoe, M. (2013) A showcase of culture and tradition – Parangal Dance Company celebrates its 5th year with 'Handuraw'. Retrieved http://asianjournal.com/aj-magazines/a-showcase-of-culture-and-tradition-parangal-dance-company-celebrates-its-5th-year-with-handuraw-on-oct-5/).

Sison, J. (2002) A law each day (Keeps Trouble Away). Retrieved http://www.philstar.com/opinion/184958/preserving-our-cultural-heritage

THE EFFECTIVENESS OF TOURISM ADVERTISEMENT TO LOCAL TRAVELERS IN THE CITY OF MARIKINA: AN ASSESSMENT

Erick P. Mante
Diana P. Dela Cruz

I. INTRODUCTION

Nowadays, local travelers seek to interact with the communities they visit. They keep discovering places that would surely love by other Filipino travelers. Islands, beaches, mountains, best food in town or even historical places that others don't mind. These are now the target of other travelers to keep love and care to not be misplaced in the mind of Filipino countrymen.

Entire new segments of travel have advanced lately in light of the collaboration with local residents in fascinating settings and environment. The objective is to make associations and instill travel with ever more evocative experiences. With the advancement of technology, travelers expect increasingly intelligent user interfaces that anticipate their demands, comprehend what they are searching for, and respond quickly with complete and customized arrangements. They additionally expect system stability and prompt responses from online service representative from their tourism advertisement.

Many companies of travel agencies put up some advertisements to get the attention of local travelers. They also have an offer for promos and packages that will help travelers lessen their expenses. It is also a convenient way into a local traveler to save more money and enjoy their visit to their destination. Advertising helps the private sector and local government units in promoting tourist spots in their area and be well known by getting the attention of other local travelers and for stimulating local economic development.

The City of Marikina was given the title as the Shoe Capital of the Philippines because of its notable shoe industry, being the biggest manufacturer of shoes in the Philippines, producing almost 70% of shoe production in the Philippines. Shoemakers in the city recently finished creating the World's Largest Pair of Shoes and it was only recently that the Guinness World Records recognized this feat. The Shoe Museum is home of the famous shoe collection of the former First Lady Imelda Marcos, shoes of the world leaders, past presidents, famous people, and shoes of different countries around the world, and making it the largest collection of pair of shoes in the world.

Marikina is noted as one of tourism and cultural hub in Metro Manila, it is also the home of Philippine Footwear Federation. Marikina is one of the wealthiest local government units in the Philippines. Aside the traditional shoe and leather industry, many places in Marikina are now recognized for its eco-friendly points, balance of industry, people and nature. Among this, the residents satisfy the basic services and transparent governance of the city. The city features typically many spacious parks, museums, tree-lined streets, bike-lanes, traffic signs, crossings, walkways, churches, antiquated houses and commercial establishments. Despite the latter, most of the city is classified as residential and industrial.

The city is also considered as one of the healthiest and livable cities within the Asia-Pacific, awarded Hall of Fame for its cleanest and greenest city, most awarded city in Metro Manila and most competitive city in the Philippines. The people of Marikina are amongst the most disciplined in the Philippines.

The researchers conducted the study with an objective of finding out the effectiveness of advertising in the promotion of domestic tourism in the City of Marikina. The main objective being is to test the extent to which various advertising attributes influences different local travelers to visit various places of tourism interest. This was based on the fact that different people get influenced by advertisements they see in the print, electronic, internet and outdoor places. Therefore, the study was set to find out if advertising had any influence on this behavior.

II. MATERIALS AND METHOD

This research utilized the quantitative research methodology. The instruments used to collect data was the observational instruments which is a set of questionnaire containing. This information will be much helpful in conducting a precise quantitative raw data analyzed according to the feed backs gathered from respondents.

The selected respondents were the random people/local travelers living outside and the residents in the City of Marikina. Respondents were those who were local travelers. They were the ones were qualified in this study.

The following instruments in gathering data used in this research were weighted mean, frequency and percentage analysis which were tabulated, analyzed and interpreted.

III. RESULTS AND DISCUSSIONS

Sub-problem No. 1. How Effective is Tourism Advertisement to Local Travelers?

Table 1

Assessment in Tourism Advertisement to Local Travelers According to TV Advertisement

TV Advertisement	Weighted Mean	Verbal Interpretation
1. Travelers easily pay attention whenever they see TV advertisement	3.92	Effective
2. TV advertisement is fast and accurate	4.00	Effective
3. TV advertisement is flexible and convenient	3.98	Effective
4. TV advertisement uses audio and visual effects to create more interest to travellers	4.33	Strongly Effective
5. TV advertisement is clear and detailed.	3.80	Neutral
Overall Weighted Mean	**4.00**	**Effective**

Table 1 presents the assessment in tourism advertisement to local travelers according to TV advertisement. As manifested in the table, the respondents assessed with the overall weighted mean of 4.00 interpreted as effective. TV advertisement uses audio and visual effects to create more with the highest weighted mean of 4.33 interpreted as strongly effective. While, TV advertisement is fast and accurate with a weighted mean of 4.00 interpreted as effective.

Table 2
Assessment in Tourism Advertisement to Local Travelers According to Social Media

Social Media	Weighted Mean	Verbal Interpretation
1. Advertisement through internet is more specific	3.99	Effective
2. Social Media is precise and interactive	4.04	Strongly Effective
3. Target client is more accessible	4.01	Effective
4. Social Media utilize relevant information	4.04	Strongly Effective
5. Serves highly relevant advertisement	3.90	Effective
Overall Weighted Mean	**3.99**	**Effective**

Table 2 depicts the assessment in tourism advertisement to local travelers according to Social Media. As showed in the table, the respondents assessed with the overall weighted mean of 3.99 interpreted as effective. Social Media is precise and interactive and Social Media utilize relevant information both with the highest weighted mean of 4.04 interpreted as strongly effective.

Table 3
Assessment in Tourism Advertisement to Local Travelers According to Print Media

Print Media	Weighted Mean	Verbal Interpretation
1. Print media are authentic sources	3.89	Effective
2. Print media are tangible	4.02	Strongly Effective
3. Print media have a creative constant to catch the attention to travelers	3.72	Neutral
4. Print media is an easy conduit to spread awareness	3.69	Neutral
5. Print media can be seen in different popular magazines	3.87	Effective
Overall Weighted Mean	**3.85**	**Effective**

Table 3 reflects the assessment in tourism advertisement to local travelers according to print media. As can be gleaned in the table, the respondents assessed with the overall weighted mean of 3.85 interpreted as effective. Print media are tangible with the highest weighted mean of 4.02 interpreted as strongly effective. While, Print media are authentic sources with a weighted mean of 3.89 interpreted as effective.

Table 4
Assessment in Tourism Advertisement to Local Travelers According to Radio Advertisement

Radio Advertisement	Weighted Mean	Verbal Interpretation
1. Have some funny quotation	4.03	Strongly Effective
2. On the spot advertisement by the popular DJ	4.00	Effective
3. Convenient in some place far from city	4.03	Strongly Effective
4. Entertaining to commuters	4.00	Effective
5. Have some tone that will make you sing	4.02	Strongly Effective
Overall Weighted Mean	**4.02**	**Strongly Effective**

Table 4 demonstrates the assessment in tourism advertisement to local travelers according to radio advertisement. As revealed in the table, the respondents assessed with the

overall weighted mean of 4.02 interpreted as strongly effective. Have some funny quotation and convenient in some place far from city both with the highest weighted mean of 4.03 interpreted as strongly effective.

Table 5
Assessment in Tourism Advertisement to Local Travelers According to Personal Advertisement

Personal Advertisement	Weighted Mean	Verbal Interpretation
1. Personal advertising has a greater impact to buyers	4.19	Effective
2. Conveys more information through personal ads	4.22	Strongly Effective
3. Personal advertising has a greater impact to customer	4.10	Effective
4. Can target message to the customers specifically	4.27	Strongly Effective
5. Can promote their domestic products properly	4.37	Strongly Effective
Overall Weighted Mean	**5.29**	**Strongly Effective**

Table 5 reflects the assessment in tourism advertisement to local travelers according to personal advertisement. As can be gleaned in the table, the respondents assessed with the overall weighted mean of 5.29 interpreted as strongly effective. Can promote their domestic products properly with the highest weighted mean of 4.37 interpreted as strongly effective. While, can target message to the customers specifically with a weighted mean of 4.27 interpreted as strongly effective.

Sub-problem No. 2. Is there a significant difference among the assessment on aforementioned variables?

Table 6
Significant Difference in the Assessments of the Respondents on Tourism Advertisement to Local Travelers

Variables	SS	df	MS	Computed F-Value	Interpretation	Decision
TV Advertisement				5.586	Significant	Reject
- Between Groups	0.208	1	0.104			
- Within Groups	0.774	8	0.029			
Social Media				8.813	Significant	Reject
- Between Groups	0.281	1	0.141			
- Within Groups	0.441	8	0.016			
Print Media				5.579	Significant	Reject
- Between Groups	0.260	1	0.130			
- Within Groups	0.512	8	0.029			
Radio Advertisement				5.500	Significant	Reject
- Between Groups	0.259	1	0.129			
- Within Groups	0.559	8	0.022			
Personal Advertisement				5.532	Significant	Reject
- Between Groups	0.239	1	0.109			
- Within Groups	0.652	8	0.002			

To determine if significant difference existed among the assessment of the respondents to the effectiveness of tourism advertisement to local travelers, the One-way ANOVA was used.

The results of the application of the F-test as shown in the statistical matrix in Table 6 revealed the following results on the extent of:

As to TV advertisement, the obtained F-value was 5.586 which is greater than the F-critical value of 5.317 at .05 level of significance. Hence, there is a significant difference in the assessment of the effectiveness of tourism advertisement to local travelers. Therefore, this leads to the rejection of the hypothesis.

As to Social Media, the obtained F-value was 8.813 which is greater than the F-critical value of 5.317 at .05 level of significance. Hence, there is a significant difference in the assessment of the effectiveness of tourism advertisement to local travelers. Therefore, this leads to the rejection of the hypothesis.

As to Print Media, the obtained F-value was 5.579 which is greater than the F-critical value of 5.317 at .05 level of significance. Hence, there is a significant difference in the assessment of the effectiveness of tourism advertisement to local travelers. Therefore, this leads to the rejection of the hypothesis.

As to Radio advertisement, the obtained F-value was 5.500 which is greater than the F-critical value of 5.317 at .05 level of significance. Hence, there is a significant difference in the assessment of the effectiveness of tourism advertisement to local travelers. Therefore, this leads to the rejection of the hypothesis.

As to Personal advertisement, the obtained F-value was 5.532 which is greater than the F-critical value of 5.317 at .05 level of significance. Hence, there is a significant difference in the assessment of the effectiveness of tourism advertisement to local travelers. Therefore, this leads to the rejection of the hypothesis.

Sub-problem No. 3. What are the problems encountered by the local travelers in Tourism Advertisement?

Table 7
Problems Encountered

Problems Encountered	Weighted Mean	Interpretation
1. Sometimes TV advertisement does not indicate the prices or the rates	4.05	Encountered
2. Not all the TV advertisement are reliable	4.12	Encountered
3. Not all indicated in social media are true	4.06	Encountered
4. Some social media advertisement can't easily replying to the inquiry	3.77	Encountered
5. Some print media can't catch the attention of the travelers	3.81	Encountered
6. Print media can't reach many clients.	4.06	Encountered
7. Radio advertisement is fast and short	4.14	Encountered
8. Radio advertisement is not clear in giving information	3.80	Encountered
9. Not all satisfying to them can satisfy also to you	3.76	Encountered
10. Personal media cannot reach many customers	3.24	Moderately Encountered
Overall Weighted Mean	**3.88**	**Encountered**

Table 7 reveals the assessment of respondents on the problems encountered by the local travelers in tourism advertisement. As presented in the table, the overall weighted mean of 3.88 as perceived by the respondents as encountered. The most common problem was radio advertisement is fast and short has a weighted mean of 4.14 interpreted as encountered.

IV. CONCLUSIONS

Based on the findings of the study, the following concluding statements are drawn:

1. In the level of the effectiveness of tourism advertisement in local travelers, the respondents assessed the TV advertisement, Social Media, and Print Media were effective with an overall weighted mean of 4.00, 3.89, and 3.85, respectively. While the Radio advertisement and Personal advertisement were assessed by the respondents as strongly effective with an overall weighted mean of 4.02 and 5.29.

2. Apparently, the difference of the assessment of the respondent in all the variables, the null hypothesis was rejected that there is no significant difference in the assessment of the effectiveness of tourism advertisement to local travelers.

3. On the other hand, the respondents assessed overall the problems encountered as encountered with an overall weighted mean of 3.88. The most common problem was that radio advertisement is fast and short and has a weighted mean of 4.14 interpreted as encountered.

V. REFERENCES

Badilla, M.G. (2015). *Tourism Marketing*. Manila, Philippines: Rex Bookstore.

Baker, K. A. & Branch, K. M. (2008). Concepts underlying organizational effectiveness: trends in the organization and management. San Francisco: Jossey-Bass Publishers.

Cruz, R.G. (2017). *EcoTourism*. Manila, Philippines: Rex Bookstore.

Guia, J. (2012), Marikina City: The Shoe Capital of the Philippines. Retrieved from https://www.vigattintourism.com/tourism/articles/Marikina-City-The-Shoe-Capital-of-the-Philippines

A COMPARATIVE STUDY OF JOB SATISFACTION OF EMPLOYEES IN GOVERNMENT AND PRIVATE COMPANIES IN MANILA

Rosemarie R. San Luis

Introduction

Job satisfaction is quite highly correlated with overall happiness of the employees within an organization, and can be looked at as one of its main components for the work performance of those employees. Job satisfaction concern if the employees are satisfied in their job. Therefore, organisations are looking to improve employee job satisfaction should attempt to meet the basic needs of employees before progressing to address higher-order needs. Motivating' factors like pay and benefits, recognition and achievement need to be met in order for an employee to be satisfied with work. On the other hand, 'hygiene' factors (such as, working conditions, company policies and structure, job security, interaction with colleagues and quality of management) are associated with job dissatisfaction. Because both the hygiene and motivational factors are viewed as independent, it is possible that employees are neither satisfied nor dissatisfied.

Job satisfaction is an outcome of different factors like pay, promotion, the work itself, supervision, relationships with co-workers and opportunities for promotions. Out of these factors, pay is a very important factor. It is found out that there is positive relationship between equity based compensation and performance.

Statement of the Problem

This study aimed to determine the job satisfaction of employees in selected government and private companies in Manila.

Specifically, this study attempted to answer the following questions:

1. What is the demographic profile of the respondents in terms of:

    1.1. Age;
    1.2. Gender;
    1.3. Civil Status;
    1.4. Highest educational attainment;
    1.5. Position; and
    1.6. Length of service?

2. What is the level of job satisfaction of respondents in terms of the following aspects:

    2.1. Health and Safety Measures;
    2.2. Needs and Benefits;
    2.3. Management System;
    2.4. Working Environment; and
    2.5. Performance and Attitude?

3. Is there a significant difference in the job satisfaction of employees as perceived by the two groups of respondents?

Research Design

The descriptive survey method of the study was used in this research. It is a fact-finding study with adequate and accurate interpretation of the findings. It describes what actually existed in the current condition, practice and any phenomena.

Population and Sampling

The researcher used the Purposive Sampling Technique since the desired criterion of the researcher is to find out the job satisfaction of employees as perceived by them. Under the purposive sampling method, non-proportional quota sampling is a sub-category wherein the researcher will specify the minimum number of sampled units she wants in each outlet. The profile of the service crews can be summarized in this wise: in terms of age, all of the respondents have ages between 21-32 years old. All of the respondents are working as service crews for the last 2years.

Respondents of the Study

The research participants of the study were the 25 employees in government and 25 in the private sector.

The following were utilized in the treatment of the data:

1. Frequency. It is the actual response to a specific item/question in the questionnaire where the respondents tick his choice.

2. Percentage. This was used as descriptive statistics or something that describe a part of the whole.

3. Weighted Mean. This was used to measure the respondents' assessments. Multiplying each value in the group by the appropriate weight factor it does and the product is summed up and divided by the total number of respondents.

Formula:

$$WM = \frac{(f_5 x5) + (f_4 x5) + (f_3 x5) + (f_2 x5) + (f_1 x5)}{N}$$

4. T-Test. A t-test's statistical significance indicates whether or not the difference between two groups' averages most likely reflects a "real" difference in the population from which the groups were sampled.

$$T = \frac{X_1 - X_2}{\sqrt{SS1+SS2\left[\frac{1+1}{N_1+N_2-2}\right]N_1\ N_2}}$$

$$= 3.95 - 3.84$$

$$\sqrt{0.14 + 0.61\left(\frac{1}{5} + \frac{1}{5 - 2}\right)}$$

$$= \frac{0.12}{0.1936}$$

$$= 0.568$$

Option	Scale	Verbal Interpretations
5	4.20 – 5.00	Very Highly satisfied
4	3.40 – 4.19	Highly Satisfied
3	2.60 – 3.39	Satisfied
2	1.80 – 2.59	Fairly satisfied
1	1.00 – 1.79	Not Satisfied

Results and Discussion

Sub Problem Number 1. What is the level of job satisfaction of the groups of respondents in terms of health and safety, needs and benefits, management system, work environment, performance and attitude?

2.1 Health and Safety

Assessment of the Respondents as to Health and Safety

Indicator	Employee X WM	VI	Employee Y WM	VI	OWM	VI
1	3.84	HS	4.04	HS	3.94	HS
2	4.60	VHS	4.04	HS	4.32	VHS
3	4.28	VHS	4.28	VHS	4.28	VHS
4	3.88	HS	4.0	HS	3.94	HS
5	3.76	HS	3.88	HS	3.82	HS
Average	**4.07**	**HS**	**4.05**	**HS**	**4.06**	**HS**

This indicates that all the five indicators with regards to the level of Job Satisfaction related to health and safety measures were rated highly satisfied except that X respondents rated indicator 2 and 3 as very highly satisfied. However taking separately the two groups with an average weighted mean of 4.07 and 4.05 both rated highly satisfied. As a whole the average overall weighted mean is 4.06 indicating a rating of highly satisfied.

2.2 Needs and Benefits

Assessment of the Respondents as to Needs and Benefits

Indicator	Emp X WM	VI	Emp. Y WM	VI	OWM	VI
1	3.60	HS	3.88	HS	3.74	HS
2	4.00	HS	2.68	S	3.34	S
3	3.28	S	2.68	S	2.98	S
4	4.24	VHS	3.28	HS	3.76	HS
Average	**3.78**	**HS**	**3.12**	**S**	**3.45**	**HS**

The assessment of the two respondents group appears to have some difference particularly indicators 2 and 4. For indicator 2, Employee X rated it as highly satisfied with a weighted mean of 4.0 while employee Y rated as satisfied with a weighted mean of 2.68. For indicator 4, Employee X rated as very highly satisfied with a weighted mean of 4.24 while Employee Y rated as highly satisfied with a weighted mean of 3.28. As to indicators 1 and 3 both rated as highly satisfied and satisfied, respectively. When taken separately Employee Y has an average weighted mean of 3.78 rated as highly satisfied while Employee Y was rated as satisfied with an average weighted mean of 3.12 . If taken as a whole, the average overall weighted mean of 3.45 indicating a rating of highly satisfied. It only shows that some employees are not fully satisfied in so far as needs and benefits are concerned.

2.3 Management System

Assessment of the Respondents as to Management System

Indicator	Emp. X WM	VI	Emp Y WM	VI	OWM	VI
1	3.02	S	4.0	HS	3.06	S
2	3.64	HS	4.0	HS	3.86	HS
3	3.88	HS	3.92	HS	3.09	S
4	3.96	HS	4.2	HS	4.08	HS
5	4.16	HS	3.92	HS	4.04	HS
6	4.08	HS	3.92	HS	4.0	HS
Average	**3.83**	**HS**	**4.0**	**HS**	**3.91**	**HS**

This table presents the assessment of the respondents of the two groups of respondents relative to management system. It shows that all the six indicators were rated by both as highly satisfied except in indicator 1 which was rated as satisfied in so far as Employee X is concerned.

However, taking separately the two groups had an average weighted mean as of 3.83 rated as highly satisfied while Employee Y has an average weighted mean of 4.0 rated also as highly satisfied taking an overall impression. An overall weighted mean of 3.91 rated as highly satisfied. This indicates that the management of the two (2) companies is not a problem when relating it to job performance

2.4 Working Environment

Assessment of the Respondent as to Working Environment

Indicator	Emp. X WM	VI	Emp Y WM	VI	OWM	VI
1	3.54	HS	3.92	HS	3.88	HS
2	3.88	HS	4.16	HS	4.02	HS
3	3.40	HS	4.04	HS	3.72	HS
4	3.60	HS	4.04	HS	3.83	HS
Average	**3.68**	**HS**	**4.04**	**HS**	**3.86**	**HS**

It appears from the table that all the four indicators were rated as satisfied except for indicator 3 which was rated as highly satisfied with a weighted mean of 3.40 for Employee X. Taking individually the two companies with average weighted mean of 3.68 while Employee Y with 4.04, both rated highly satisfied collectively the two groups of respondents generally rated working environment as highly satisfied.

2.5 Performance and Attitude

Assessment of the Respondents as to Performance and Attitude

Indicator	Emp X WM	VI	Emp Y WM	VI	OWM	VI
1	4.32	VHS	3.84	HS	4.08	HS
2	3.84	HS	3.88	HS	3.86	HS
3	4.28	VHS	4.04	HS	4.16	HS
4	4.44	VHS	3.96	HS	4.20	VHS
5	4.08	HS	4.04	HS	4.06	HS
Average	**4.19**	**HS**	**3.96**	**HS**	**4.07**	**HS**

This table indicates that all the five indicators related to performance and attitudes, were rated as very highly satisfied and highly satisfied, respectively. The average weighted mean of Employee X is 4.19 and Employee Y is 3.96, both rated highly satisfied, indicating that there is a commonality of satisfaction of the two (2) companies.

Sub-problem number 3. Is there a significant difference between the job satisfaction of employees in the government and private companies as perceived by the two groups of respondents?

Statistical Analysis Related to Employee Job Performance

	WM	Computed T. Value	Tabular T. Value	Decision
Employee X	3.95	0.568	1.84	HO Accept
Employee Y	3.83			

From the result of the t-test, it appears that the computed t value of 0.568 is lower when compared with the t tabular value of 1.86 at .05 level of significance and 8 degrees of freedom. Thus, indicating that the respondents' perception with regards to the employee job satisfaction of the two companies is not significantly different.

Summary of Findings

The findings of the study are as follows:

1. The perception of respondents in selected government and private companies in Manila relative to their assessment of demographic profile in terms of:

1.1 **Age.** Majority of the respondents are young within the brackets of 21 – 32 age level

1.2 **Gender.** Majority of the respondents are female.

1.3 **Civil Status.** Most of the respondents are single.

1.4 **Educational Attainment.** Majority of the respondents are college graduates.

1.5 **Position.** Reveals that 40% were rank and file employees.

1.6 **Length of Service.** Indicates that most employees were within the bracket of 6 – 10 years length of service.

2. Assessment of the respondents on the level of job satisfaction of Employee X and Employee Y in Manila in terms of:

2.1 **Health and Safety Measures.** Group of respondents were assessed with an average weighted mean of 4.07. In the case of Employee Y, it was rated as "highly satisfied" with an average weighted mean of 4.05. Collectively, both registered an overall weighted mean of 4.06 rated as "highly satisfied".

2.2 **Needs and Benefits.** The assessment of respondents from Employee X was "highly satisfied" with an average weighted mean 3.78. On the other hand, Employee Y was assessed as "satisfied" with an average weighted mean of 3.12.

2.3 **Management System.** Group of respondents assessed it as "highly satisfied" with an average of weighted mean of 3.83. Where as in Employee Y, it was also assessed as "highly satisfied" with an average weighted mean of 4.0. Both enjoying an overall weighted mean of "highly satisfied".

2.4 **Working Environment.** Respondents of Employee X assessed it as "highly satisfied" with an average weighted mean of 3.68 while Employee Y got an average weighted mean of 4.04 rated as "highly satisfied".

2.5 **Performance and Attitude.** The group of respondents assessed it as "highly satisfied" with an average weighted mean of 4.19. On the other hand, Employee Y was assessed as "highly satisfied" also with an average weighted mean of 3.96.

Respondents' perception with regards to the assessment on employee job satisfaction is not significantly different.

Conclusions

In the light of the above findings, the following conclusions were drawn:

1. Majority of the respondents were young and single, college graduates mostly rank and file employees with a 6-10 years length of service from both government and private sectors.

2. Using the five indicators the two sectors were rated both as "highly satisfied" with the exception of Employee Y as to its needs and benefits.

3. Apparently, the respondents' perception with regards to employee performance of the two sectors is not significantly different.

Recommendations

Taking into account the findings and conclusions of the study, the following recommendations are adviced:

1. In as much the two (2) sectors have shown the same excellence as to the level of job satisfaction of its employees in the areas of health and safety measures, management systems, working environment and performance and attitude, more effort should be pushed through to upgrade the needs and benefits of its employees that would result in the satisfaction also of its clientele.

2. Further research should be encouraged or a similar replication study be initiated to validate or confirm the result of this study.

REFERENCES

A. Books

Cabanda, E. (2008).Performance Management: Applications of data envelopment analysis in the Philippine setting. Manila: University of Santo Tomas Press.

Rollinson, D. (2005).Organisational Behaviour and Analysis: An Integrated Approach. Harlow, Essex: Pearson Education Limited.

Young, F. (2006).Organization development made simple. Quezon City: Abiva Publishing.

B. Journals and Periodicals

Chen, J. & Silverstone, M. (2005). Leadership effectiveness, leadership style and employee-readiness. Leadership and Organization Development Journal.

Grizinic, J. (2007). Concepts of service quality measurement in the hotel industry. University Jurje Dobrile.

Wu, Tsai, Fey & Wu (2006). A study of the relationship between manager's leadership style and organizational commitment in Taiwan's international tourist hotels. Asian Journal of Management and Humanity Sciences.

C. Website

http://www.ukessays.com/essays/business/impact-of-job-satisfaction-on-the-employees-performance-business-essay.php#ixzz3mfZyoCzV

Copyright © 2003 - 2016 - UK Essays is a trading name of All Answers Ltd, a company registered in England and Wales. Company Registration No: 4964706. VAT Registration No: 842417633. Registered Data Controller No: Z1821391.

Amstrong M.(2006)*Human Resource Management Practices*, 10thedition, Kogan PageLimited.

Cleveland State University 2006, *Job Satisfaction and Promotions*, [PDF], Available at:http://academic.csuohio.edu/kosteas_b/Job%20Satisfaction%20and%20Promotions.pdf [Accessed: 8 August 2012]4.

eHow 2012,*What is Job Security?* ,[Online], Available at: http://www.ehow.com/about_5470562_job-security.html [Accessed: 1 August 2012]5.

Griffin R.W. (2004),*Management,*Houghton Mifflin Company, U.S.A.6.

Hill, B. 2012,*What Are the Factors Affecting Job Satisfaction?*,[Online] Available At: http://smallbusiness.chron.com/factors-affecting-job-satisfaction-20114.html [Accessed:10 August 2012

D.Theses and Dissertations

Calleja, M. (2006). The relationship of human resource management roles and practices and organization effectiveness. Ateneo de Manila University, Philippines.

Hartline, J. & Keith (2009).The effects of leadership style on hotel employees' commitment to service quality. Cornell University.

Joe, O. (2006).Strategic human resource management, small and medium-sized enterprises and strategic partnership capability. Slipping Rock University of Pennsylvania, USA.

Liu, Y., Combs, J., Hall, A. & Ketchen, D. (2006).How much do high performance work practices matter: A meta-analysis of their effects on organizational performance. Florida State University, USA.

Tang, R., Restubog, S., & Cayayan, P (2007). Investigating the relationship between psychological contract breach and civic virtue behavior. De La Salle College of Saint Benilde, University of Queensland, Australia and PAREF-West bridge School

RISK REDUCTION PROGRAM IMPLEMENTED BY SELECTED 4 STAR HOTELS IN TAGAYTAY CITY

Mary Grace C. Santos
Evelyn R. Celestial
Rodita M. Buencuchillo

I. INTRODUCTION

Disaster risk reduction is the concept and practice of reducing disaster risks through systematic efforts to analyze and reduce the causal factors of disasters. Reducing exposure to hazards, lessening the vulnerability of people and property, wise management of land and the environment, and improving preparedness and early warning for adverse events are all examples of disaster risk reduction.

The Philippines is identified as a natural disaster hot-spot and is ranked third among the most disaster risk countries in the world (United Nations University Institute of Environment and Human Security), where a large percentage of the population resides in disaster-prone areas. Typhoons and tropical storms, flood, and earthquakes continue to cause thousands of human deaths and injuries in the country despite efforts of various organizations to intensify strategies for disaster risk reduction. An increase in extreme weather conditions has been attributed to global warming Intergovernmental Panel on Climate Change which perpetuates climate change.

Disasters experienced by hospitality industry have steadily increased over the past few decades. Disaster management has become an important issue as hospitality key players seek ways to cope with these unexpected events, which confound threats to the viability of hospitality organizations and create multiple challenges for the private and public sectors.

The study aimed to identify business interest and need for specific disaster risk management standards in the industry and analyzed how these could be best designed to be most effective in reducing disaster risks. The study reflected many of the key findings of the literature available. It was confirmed that there is a need for standardized disaster risk management procedures and processes, especially in independent hotels to promote best practice and to encourage more emphasis on disaster risk reduction, rather than disaster response.

The researchers decided to conduct the study to know the risk reduction programs implemented by 4 selected star hotels in Tagaytay City.

II. METHODOLOGY

This research utilized the descriptive method of research with survey questionnaire as a technique for gathering data. This method presented and provided systematic and factual information that is used to assess and evaluate conditions and indicators being investigated and the relationship between variables to the development of studies which seek to determine changes over time. This is a cross-sectional type of research which is given at one point in time. There were 30 hotel management and 60 hotel staff respondents in the study composed mainly of the selected 4-star hotels in Tagaytay City. A purposive sampling technique was used to determine the sample size of the population. Purposive sampling is a non-probability sampling method and it occurs when elements selected for the sample are chosen by the judgment of the researcher.

III. RESULTS AND DISCUSSION

Sub Problem No.1: How do the respondents assess the Risk Reduction Program in Selected 4 Star Hotels in Tagaytay City?

Table 1

Assessment on Risk Reduction Program of 4 Star Hotels

Criteria	Hotel Management		Hotel Staff		Composite		Rank
	WM	VI	WM	VI	WM	VI	
1. The Hotel conducts seminars or training about disaster preparedness to hotel staffs	4.67	HI	4.40	HI	4.54	HI	10
2. The Hotel increased the level of awareness and enhanced capacity of the community to the threats and impacts of all hazards	4.90	HI	4.47	HI	4.69	HI	6
3. The Hotel increased the level of awareness and enhanced capacity of the community to the threats and impacts of all hazards	4.87	HI	4.47	HI	4.67	HI	7
4. The Hotel conduct several risk assessments, procedures for disaster response operations, improved skills in search, rescue and retrieval operations	4.80	HI	4.47	HI	4.64	HI	9
5. The Hotel raised public awareness of Disaster Risk Reduction and mitigating the impacts of natural disasters through the formulation and implementation of a communication Plan for DRR	4.80	HI	4.50	HI	4.65	HI	8
6. The Hotel staffs know what to do if an earthquake occurs. They discussed earthquakes ahead of time helps reduce fear and anxiety and lets everyone know how to respond	4.97	HI	4.57	HI	4.77	HI	2
7. The Hotel takes the first-aid class from an organization such as the American Red Cross, American Heart Association, or National Safety Council chapter	4.94	HI	4.47	HI	4.71	HI	4
8. The Hotel conduct orientation/training to the staffs and management regarding risk assessment, flood, storm surge, tsunami, earthquakes etc. that can help during calamities	5.00	HI	4.50	HI	4.75	HI	3
9. The Hotel staffs familiarize themselves with the general structure of the building and its premises and the specific uses of the different types of portable fire extinguishers	5.00	HI	4.57	HI	4.79	HI	1
10. The Hotel management cooperates with the intelligence and police agencies to prevent crimes and terrorist activities	4.86	HI	4.53	HI	4.70	HI	5
Overall Weighted Mean	**4.88**	**HI**	**4.50**	**HI**	**4.69**	**HI**	

Legend:

Option	Range	Verbal Interpretation	Symbol
5	4.20 – 5.00	Highly Implemented	HI
4	3.40 – 4.19	Implemented	I
3	2.60 – 3.39	Moderately Implemented	MI
2	1.80 – 2.59	Least Implemented	LI
1	1.00 – 1.79	Not Implemented	NI

As established in Table 1, the assessment on the risk reduction program of 4-star hotels was rated as highly implemented with an overall weighted mean of 4.69. All items were rated as highly implemented, namely; The Hotel staffs familiarize themselves with a general structure of the building and its premises and the specific uses of the different types of portable with a composite weighted mean of 4.79 as rank 1; The Hotel staffs know what to do if an earthquake occurs. They discussed earthquakes ahead of time helps reduce fear and anxiety and lets everyone know how to respond with a composite weighted mean of 4.77 as rank 2; The Hotel conduct orientation/training to the staffs and management regarding risk assessment, flood, storm surge, tsunami, earthquakes etc. that can help during calamities with a composite weighted mean of 4.75 as rank 3; The Hotel takes first-aid class from an organization such as the American Red Cross, American Heart Association, or National Safety Council chapter with a composite weighted mean of 4.71 as rank 4; The Hotel management cooperates with the intelligence and police agencies to prevent crimes and terrorist activities with a composite weighted mean of 4.70 as rank 5; The Hotel increased level of awareness and enhanced capacity of the community to the threats and impacts of all hazards with a composite weighted mean of 4.69 as rank 6; The Hotel increased level of awareness and enhanced capacity of the community to the threats and impacts of all hazards with a composite weighted mean of 4.67 as rank 7; The Hotel raised public awareness of Disaster Risk Reduction and mitigating the impacts of natural disasters through the formulation and implementation of a communication Plan for DRR with a composite weighted mean of 4.65 as rank 8; The Hotel conduct several risk assessments, procedures on disaster response operations, improved skills in search, rescue and retrieval operations with a composite weighted mean of 4.64 as rank 9 and The Hotel conducts seminars or training about disaster preparedness to hotel staffs with a composite weighted mean of 4.54 as rank 10.

Further, the group of respondents' assessment on the assessment on the risk reduction program of 4-star hotels was rated as highly implemented, these were: Hotel Management with an overall weighted mean of 4.88; and Hotel Staff with an overall weighted mean of 4.50.

Sub Problem No. 2 Is there a significant difference on the assessment of respondents as to the Risk Reduction Program Implemented in Selected 4 Star Hotels in Tagaytay City when grouped according to hotel management and hotel staff?

Table 2

Comparison of Assessment on the Risk Reduction Program Implemented in Selected 4 Star Hotels in Tagaytay City

df WM SD	t-value	critical value	Decision	Interpretation
88 4.88 0.01 4.50 0.00	0.39864	1.658	Accept Ho	Not Significant

Legend: @0.05 level of significance

As depicted in Table 2, the computed t-value on the Risk Reduction Program Implemented in Selected 4 Star Hotels in Tagaytay City as assessed by hotel management and hotel staff is 0.39864 which is lower than the critical value of 1.658 with the degree of freedom of 88 at 0.05 level of significance. Hence, there is no significant difference on the assessment of Risk Reduction Program Implemented in Selected 4 Star Hotels in Tagaytay City. Therefore, the hypothesis is accepted.

Sub Problem No. 3 What are the problems encountered as to the implementation of Risk Reduction Program in Selected 4 Star Hotels in Tagaytay City?

Table 3

Problems Encountered on the Implementation of Risk Reduction Program in Selected 4 Star Hotels

Criteria	Hotel Management		Hotel Staff		Composite Weighted Mean		Rank
	WM	VI	WM	VI	WM	VI	
1. The hotel information maps are not updated	1.83	E	1.16	E	1.50	NE	7
2. Lack of experience for hoteliers in case of emergencies	3.40	E	3.89	E	3.65	E	2
3. No ease of access to fire exits or No location in the hotel to read outside the room	1.49	E	1.15	E	1.32	NE	9
4. Employees have no potential in emergency situations	1.51	E	1.92	E	1.72	NE	4.5
5. Employees are not receiving messages timely	1.56	E	1.87	E	1.72	NE	4.5
6. Wrong dissemination of messages in case of panic	3.71	E	4.10	E	3.91	E	1
7. Communication is hindered by fear and alarm	1.61	E	1.16	E	1.39	NE	8
8. Fire alarms have a malfunction	1.43	E	1.11	E	1.27	NE	10
9. Each department is not sharing information	3.49	E	3.48	E	3.49	E	3
10. Other equipment like fire extinguishers have technical issues	1.55	E	1.68	E	1.62	NE	6
Overall Weighted Mean	**2.16**	**LE**	**2.15**	**LE**	**2.16**	**LE**	

Legend:

Option	Range	Verbal Interpretation	Symbol
5	4.20 – 5.00	Highly Encountered	HI
4	3.40 – 4.19	Encountered	I
3	2.60 – 3.39	Moderately Encountered	MI
2	1.80 – 2.59	Least Encountered	LI
1	1.00 – 1.79	Not Encountered	NI

As exhibited in Table 3, the Problems Encountered on the Implementation of Risk Reduction Program in Selected 4 Star Hotels were rated as Least Encountered with an overall weighted mean of 2.16. Three (3) items were rated as Encountered, these were: Wrong dissemination of messages in case of panic with a composite weighted mean of 3.91 as rank 1; Lack of experience for hoteliers in case of emergencies with a composite weighted mean of 3.65 as rank 2; Each department is not sharing information with a composite weighted mean of 3.49 as rank 3. Seven (7) items were rated as Not Extent, namely: Employees have no potential in emergency situations, and Employees were not receiving messages timely with a composite weighted mean of 1.72 as rank 4 and 5; Other equipment like fire extinguishers has technical issues with a composite weighted mean of 1.62 as rank 6; The hotel information maps were not updated with a composite weighted mean of 1.50 as rank 7; Communication is hindered by fear and alarm with a composite weighted mean of 1.39 as rank 8; No ease of access to fire exits or No location in the hotel to read outside the room with a composite

weighted mean of 1.32 as rank 9; and Fire alarms have malfunction with a composite weighted mean of 1.27 as rank 10.

Further, the group of respondents' assessment on the assessment on the Problems Encountered on the Implementation of Risk Reduction Program in Selected 4 Star Hotels were rated as Least Encountered, these were: Hotel Management with an overall weighted mean of 2.16; and Hotel Staff with an overall weighted mean of 2.15.

IV. CONCLUSIONS AND RECOMMENDATIONS

In the light of the findings of the study, the following conclusions were derived.

1. The Risk Reduction Program Implemented in Selected 4 Star Hotel in Tagaytay City was rated as highly implemented.

2. The two groups of respondents did not differ on their assessment on the assessment of Risk Reduction Program Implemented in Selected 4 Star Hotels in Tagaytay City. Therefore, the hypothesis was accepted.

3. The Problems encountered on the Risk Reduction Program Implemented in Selected 4 Star Hotel in Tagaytay City was encountered. There was the least problem encountered such as, lack of experience for hoteliers in case of emergencies, wrong dissemination of messages in case of panic and each department is not sharing information.

From the findings and conclusions, the following recommendations are suggested.

1. The hotel and staff management may continue to maintain the implementation of risk reduction program while at the same time continue finding new ways to implement risk reduction program.

2. The management and staff must continue to collect feedbacks regarding the risk reduction program.

3. Problems, though least encountered should be given prompt attention to avoid further issues or concerns.

4. A similar study may be conducted using other setting variables and respondents to verify the validity of the research.

REFERENCES

Alcayna (2016), Resilience and Disaster Trends in the Philippines: Opportunities for National and Local Building Retrieve From http://currents.plos.org/disasters/article/resilience-and-disaster-trends-in-the-philippines-opportunities-for-and-local-capacity-building/

Alexander (2012), Natural Disaster Retrieved From:https://bookgoogle.com.ph/books?id=gWHsuGTcF34C&printsecfrontcover&source=gbs_ge_summary_r&cad=0#v=onepage&g&f=false

Quebral, V. (2016), Disaster readiness risk and reduction. Quezon City Lorimar Publishing, Inc., pp. 1-3

AlBattat, A.R. (2013), Emergency Preparedness for Disasters and Crises in the Hotel Industry, pp.2-10

Cocchiglia, M. (2012), Local Governments and Disaster Risk Reduction Good Practices and Lessons, Learned pp. 8-13

Sobremisana, V.S. (2014), Disaster Risk Reduction Management in the City of Mandaluyong: Focus on Earthquake Impact Reduction, pp. 1-3

Tostovrsnik, N. (2015), Developing Strategies to Strengthen the Resilience of Hotels to Disasters pp. 6-29

Alconaba, N. (2012), Davao Oriental won awards for Preparedness Retrieved From http://www.inquirer.net/philippine-typhoon-news/articles?nav=321865&chan=10|

Bates (2017), Disaster Management Retrieved From: https://www.wcpt.org/Disaster-management/what-is-disaster-management

Clarke (2014), The Effectiveness of Disaster Risk Communication A Systematic Review of Intervention Studies Retrieved From: https://www.ncbi.nlm.nih.gov/pmc/articles/ PMC41724

Department of Internal and Local Government of the Philippines (2012), Disaster Preparedness. Retrieved From: http://ecogroup3. weeblty.com/chapter-2-review-of-related-literature.html

Favaro (2015), Implementation. Retrieved From: http://hbr.org/2015/03/defining-strategy-implementation-and-execution

Hiller, S. (2015), Top 5 risks and security challenges for hotels in 2015. Retrieved From https://ehotelier.com/insights/2015/01/23/top-5-risks-and-security-challenges-for-hotels-in-2015/

Klemmer, L. (2015), Using social media in hotel crisis management: The case of bed bugs. Retrieved From: https://www.researchgate.net.publication/280539120Using_social_ media_in_hotel_crisis_management_The_case_of_bed_bugs

Magtibay (2016), Tagaytay city gov't fails to implement 16 million disaster risk reduction projects. Retrieved From: http://www.southluzon.politics.com.ph/2016/11/10/tagaytay-city-govt-fails-to-implement-p16m-disaster-risk-reduction-projects/

Maletz, P. (2017), Reducing Risk to improve the value of your Hotel.Retrieved From Copyright 2017 Hanrick Curran. Site Map | Privacy Policy|

Nand, L.F. (2008), Defining Risk Management. Retrieved From:http://www.hotelnewsnow.com/Articles/3038/ Risk-management-A-hoteliers-guide

Salanti, D. (2017), Disaster Risk Reduction Program. Retrieved From:http://www.seepnetwork.org/disaster-risk-reduction program-pages-20799.php

Twigg (2015), Risk Reduction. Retrieved From: https://goodpracticereview.org/wp-content/uploads/2015/10/GPR-9web-string-1.pdf

Zibulewsky (2012), Disaster. Retrieved From: https://www.ncbi.nlm.nih.gov/pmc/articles/ PMC1291330

INTERACTIVE WORKTEXT IN ENGLISH

Edwin V. Tendero

INTRODUCTION

English is the key language used in global affairs, medium for the communication of information and news, and eighty percent of computer data are processed and stored in English. The significance of English is not just how many people speak it but in what it is used for. It is incredibly useful for this serves as our worldwide language.

Because of its value, English is one of the core subjects in all schools around the world. English subject is one of the learning areas that increases learner's confidence and aptitude of using language for effective communication and critical thinking in the real world.

English language is a dynamic social process which responds to and reflects changing social conditions since we are now in the "Knowledge Age" where the challenge of education is to prepare learners to deal with the challenges of the changing world. Students in this age must be prepared to compete in a global economy, understand and operate complex communication and information systems, and apply higher level thinking skills to make decisions and solve problems.

Therefore, English as subject is concerned with the development of communicative competence. Communicative competence is classified into grammatical or linguistic, sociolinguistic, discourse, and strategic competencies. Grammatical or linguistic competence means the acquisition of phonological rules, morphological words and syntactic rules. In addition, learners learn about language and use it effectively through their engagement with and study of text. The term "text" refers to any form of written, oral and visual communication involving language. Consequently, successful language learning involves viewing, listening, speaking, reading and writing activities. Through language learning, learners develop functional and literacy skills.

English teaching shall encourage learners to learn through hands-on and mind-on manipulative and interactive activities. Students learn on-their-own, explore, discover, generalize and apply what they learned in their day to day activities. These activities shall be made effectively by using appropriate teaching strategies, approaches, techniques and adequate instructional materials.

Quality education nowadays is dependent upon the quality of instruction which is enhanced by well-crafted and good instructional materials. This is why the researcher came up with the idea of developing and validating of an interactive worktext as an instructional material to improve and enhance communication and grammar skills of the first-year students of College of Hospitality Management school year 2017-2018.

Conceptual Framework

It is extremely imperative that appropriate instructional materials for the development of students' skills be satisfactorily provided. It is not enough that the teachers simply give the essential learning experiences to the students, but also provides them with effective and innovative instructional materials suited to their needs, interest and level of understanding to maximize learning potential for students.

Because of these concepts, the researcher has recognized the need of developing an instructional material to enhance reading and grammar skills of the students.

Computer-aided tools and strategies in teaching are believed to be more effective than usual instructional method for developing concepts and skills essential to instructions for higher cognitive process. In this connection, the present study is a computer-aided instructional material in teaching English. It is presented in a soft copy (power point presentation saved in USB flash drive and CD) and a hard copy (Skill book) of it is available in case computer is inaccessible.

This study, "AN INTERACTIVE WORKTEXT IN ENGLISH is presented and shown in Figure 1. The Input-Process-Output (IPO) block reflects the transformation flow of the different stages.

In the Input block, the researcher considered the skills and instructional materials utilized by the teachers, the proposed Interactive Worktext in English.

From the output block, the researcher hopes to come up with an effective interactive worktext in English.

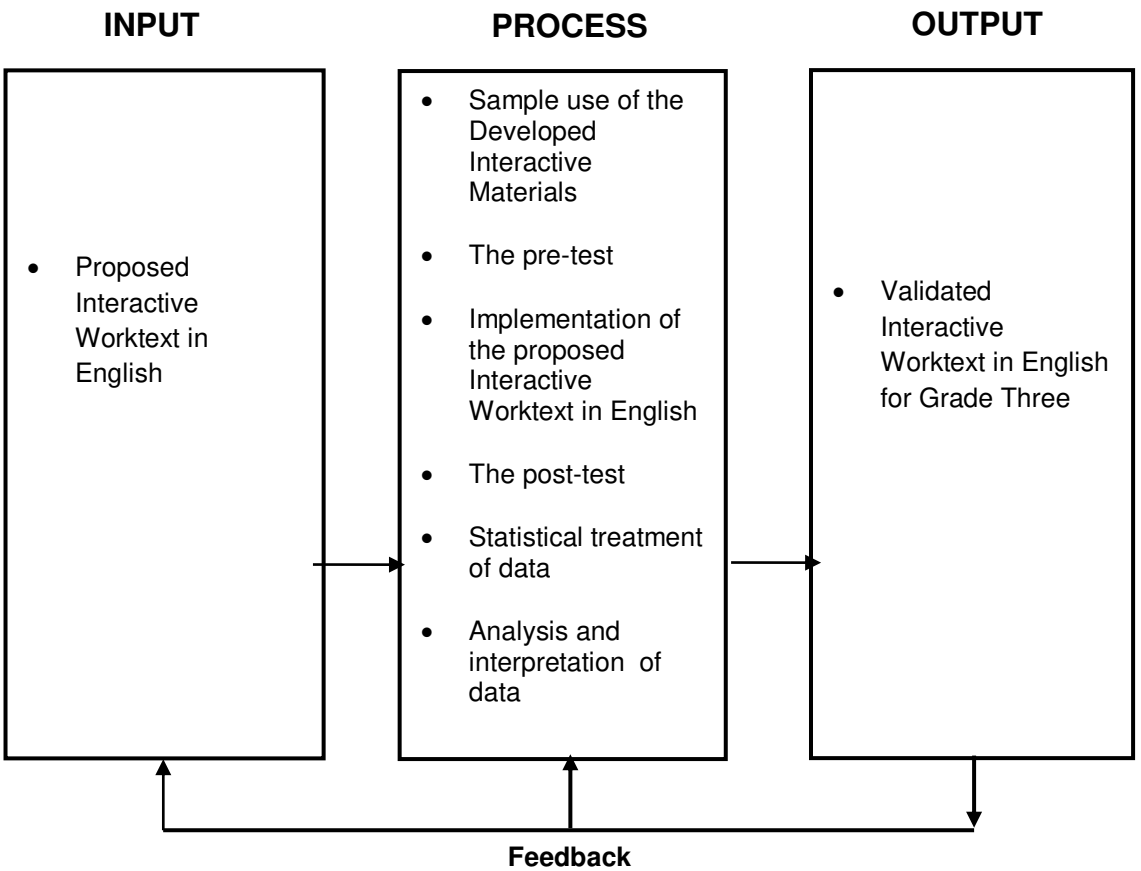


Figure 1: Conceptual Framework of the Study

Statement of the Problem

The present study aimed to develop an interactive worktext for students as an instructional material to improve students' communication and grammar skills.

Specifically, it sought to answer the following questions:

1. What are the common problem of the students in developing their communication and grammar skills?

2. What instructional materials could be developed to enhance the communication and grammar skills in English?

3. What is the performance level of the respondent students in the pretest and posttest? Is there significant difference?

Hypothesis

This study hypothesized that there is no significant difference between the pretest and posttest of the respondent students.

Scope and Limitation of the study

The scope of this study covered the development of an instructional material to enhance communication and grammar skills of the HRM first year students.

The developed instructional material is entitled "Interactive Worktext in English" which was presented in a hard and soft copy. The hard copy of this Interactive Worktext could easily be used in the teaching-learning process in the absence of computers. This material had a conversational-style of presentation which seems the material itself talks and gives directions to the readers and allows information to be transferred immediately from the materials to its user.

However, the soft copy or the power point presentation of this interactive worktext had been saved into a CD or USB. The content of the soft copy is almost the same with the hard copy but this could only be used by the students and teachers where television, laptop, projectors or computer units are accessible. Both of the materials are user-friendly because the student could perform or use it by himself or with a minimal supervision by the teacher.

METHODOLOGY

Research Design

The normative, developmental and evaluative descriptive research designs were used in this study. The normative descriptive design was used in gathering data on the problems met by the students in developing their communication and grammar skill in English.

Respondents of the Study

The respondents of the study were 120 students from two sections of College of Hospitality Management enrolled in first semester of school year 2017-2018. One would not use the proposed interactive worktext in English and the other would use it.

Statistical Treatment of Data

The following statistical tools were used in the study:

1. Frequency. This is the actual responses to a specific item or question in the questionnaire where the respondents have chosen.

2. Percentage. This was used to establish the distribution of the English teacher and the English expert respondents in District III of the Division of Pasig City.

Formula:

$$\text{Percentage} = \frac{f}{N} \times 100$$

Where:

f -frequency

N-total number of respondents

100-constant value/factor

3. Weighted Mean. This is used to determine the perception of the English teacher and expert respondents to the different aspects of the developed interactive worktext.

Formula

$$\text{Weighted Mean WM} = \frac{\sum wf}{\sum f}$$

Where:

w	=	weight of each factor
f	=	frequency
Σf	=	the total number of respondents

4. The Likert Scale Method. This criterion served as the basis for interpretation of data. The scales used in the study are as follows:

4.1 Assessment on the Common Problems Met by the Students in Developing their Communication and Grammar Skills.

Options	Ranges	Verbal Interpretation
5	4.20-5.00	Very Highly Common Problem (VHCP)
4	3.40-4.19	Highly Common Problem (HCP)
3	2.60-3.39	Common Problem (CP)
2	1.80-2.59	Least Common Problem (LCP)
1	1.00-1.79	Not a Problem (NP)

5. Standard Deviation. This was used to determine the dispersion of the scores from the mean. It was used to evaluate the degree of difference between the pretest and post-test mean scores of the subject respondents.

$$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{N-1}}$$

Where:

s = Standard Deviation

N = number of subjects

x_i = score-response

$\bar{x}$ = mean or average

6. t-test. This was used to determine the significant difference between the assessments of the two groups of respondents as well as the significant difference between the pre and post-test of the students.

$$t = \frac{\overline{x_T} - \overline{x_E}}{\sqrt{\frac{(N_T - 1)s_T^2 + (N_E - 1)s_E^2}{N_T + N_E - 2} \cdot \left[\frac{1}{N_T} + \frac{1}{N_E}\right]}}$$

Where:

t = computed t-value

S_T^2 = variance of the responses of the first group of Student respondents

S_E^2 = variance of the responses of the second group of student respondents

N_T = total number of the first group of the group of Student respondents

N_E = total number of the second group of the group of student respondents

$\overline{x_T}$ = mean of the responses of the group of student respondents

$\overline{x_E}$ = mean of the responses of the group of student respondents

PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This chapter presents the analysis and interpretation of the organized data collected from the groups of respondents. Each group of data was analyzed and interpreted based on the problems raised in the study and with their corresponding tables presented sequentially to give further details on data presentation analysis.

Sub-Problem No.1: What are the common problems of the students in developing their communication and grammar skills?

Table 1

Common Problems Met by the students in Developing Communication and Grammar Skills

Common Problems Met by the students in Communication and Grammar Skills			Rank
1. Attractive, interesting and innovative teaching materials are insufficient	4.81	VHCP	1.5
2. Classrooms are not conducive for learning	4.22	VHCP	4
3. Learning Materials have limited and irrelevant exercises to master the skills	4.81	VHCP	1.5
4. Poor study habits and attitude toward the subject	4.50	HCP	3
5. Pupils have Irregular Attendance	4.11	HCP	5
Grand Mean	**4.49**	**VHCP**	

Legend:

Options	Ranges	Verbal Interpretation
5	4.20-5.00	Very Highly Common Problem (VHCP)
4	3.40-4.19	Highly Common Problem (HCP)
3	2.60-3.39	Common Problem (CP)
2	1.80-2.59	Least Common Problem (LCP)
1	1.00-1.79	Not a Problem (NP)

Table 1 had shown the ranking and computed composite with its weighted mean and verbal interpretation of the common problems met by the student respondents in communication and grammar skills. It is noted in Table that the first two common problems which both rank 1.5, with a weighted mean (WM) of 4.81 and verbal interpretation of Very Highly Common Problem were “Attractive, interesting and innovative teaching materials are insufficient and Learning Materials have limited and irrelevant exercises to master the skills”. These were followed by “Poor study habits and attitude toward the subject” as rank no. 3 with the weighted mean 4.50 (Very Highly Common Problem). Rank no. 4 was “Classrooms are not conducive for learning” with a weighted mean of 4.22 (Very Highly Common Problem) and the last problem which rank no. 5 was “students have Irregular Attendance” with the weighted mean of 4.11 and interpreted as Highly Common Problem. Based on the table, the researcher concluded that insufficiency of an attractive, innovative teaching materials with adequate exercises is one of the focal problems of the teachers in increasing students communication and grammar skills.

Sub-Problem No.2: What instructional materials could be developed to enhance the communication and grammar skills in English?

Based on the results of the common problems met by the students, the researcher decided to develop an Interactive Worktext in English. This is to provide the students with instructional materials which could be useful and effective to enhance the communication and grammar skills of the learners.

This Interactive Worktext in English is presented in a soft (power point presentation) and a hard copy of instructional materials. It is named interactive worktext since it has a conversational-style of presentation that seems the material itself talks and gives directions to the students and allowing information to be transferred directly from the materials to its user.

The content of this material is almost the same as the hard copy. This material is very utilizable and efficient wherever television, laptop, projectors or computer units are accessible. Similar with the hard copy, this is too a user-friendly instructional material, since the student could execute or utilize it with least teacher's supervision.

Ample exercises or activities were provided for the students' further learning of the skills. They can also work on the exercises at their own speed with little or no teacher's assistance to master a skill before going to the next skill. Students might easily check their answers through the Key Answer at the last part of the materials.

Sub-Problem No.3: What is the performance level of the respondent students in the pretest and posttest? Is there significant difference?

Table 2

Performance of the Students in their Pretest and Post Test After Using the Interactive Materials

VARIABLES	Results		Computed t-value	Critical Value	Decision	Interpretation
	Pretest Mean S. Deviation	Posttest Mean S. Deviation				
Mean Scores	13.25	14.93	-10.55	1.98	Reject	Significant
	3.01	2.11				

As seen on the mean scores of pre-test the variables mean which is 13.25 and standard deviation pretest is 3.01 with computed t-value of -10.55 and the critical value is 1.98, the decision is "reject" and the interpretation is "significant". On posttest, the mean is 14.93 and the standard deviation is 2.11 with the computed t-value of -10.55 and the critical value is 1.98, the decision is "reject" and the interpretation is "significant". Based on the above data, the use of the proposed interactive worktext in English has significantly improved the performance of the students.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

The following are the summary of the findings of the specific problems raised in the study.

1. What are the common problem of the students in developing their communication and grammar skills?

The most common problems met by the student respondents in communication and grammar skills were "Attractive, interesting and innovative teaching materials are insufficient and Learning Materials have limited and irrelevant exercises to master the skills". These were

followed by "Poor study habits and attitude toward the subject"; "Classrooms are not conducive for learning", and the last problem was "students have Irregular Attendance". Based on the table, the researcher concluded that insufficiency of an attractive, innovative teaching materials with adequate exercises is one of the focal problems of the teachers in increasing students' communication and grammar skills.

2. What instructional materials could be developed to enhance the communication and grammar skills in English?

The instructional material the researcher recommended is the use of interactive worktext in English as an effective tool in teaching English for the development of communication and grammar skills of the students

3. What is the performance level of the respondent students in the pretest and posttest? Is there significant difference?

Based on the data, the use of the proposed interactive worktext in English has significantly improved the performance of the students.

Conclusions

Based on the foregoing summary of findings, the following conclusions were drawn.

1. The most common problems of the students in developing their communication and grammar skills are attractive, interesting and innovative teaching materials are insufficient; classrooms are not conducive for learning; learning materials have limited and irrelevant exercises to master the skills; poor study habits and attitude toward the subject; students have Irregular Attendance.

2. The use of interactive worktext in English is much recommended. Utilizing it not only provides stimulating and effective instruction it also allows teachers flexibility with course content and provides a learning environment in which students can begin to develop autonomy.

3. There is a significant difference in the performance of students during their pretest and posttest with the decision of rejecting the hypothesis.

Recommendations

In the light of the findings and conclusions of the study, the following recommendations are given:

1. The Teacher must be provided with all the learning instructional materials needed for the development of the communication and grammar skills of the students.

2. The teachers and students must be equipped with interactive worktext in English in order to fully understand the printed/text materials for easy facilitation of the lessons.

3. The students and teachers must look for products that prompt students to access supports, apply strategies, and pause and monitor comprehension in reading.

College Research Coordinators

Arch. Rolan B. Alamillo
CAFA

Prof. Ronald B. Baral
CEN

Prof. Jesther Itliong
CAS

Dr. Daisy P. Burgo
CBA

Dr. Gloria T. Miano
CED

Dr. Jeffrey B. Villena
CHM

Prof. Erwin P. Ordovez
CIT

Dr. Marlene M. Monterona
CPAC

Dr. Editha V. Pillo
PRESIDENT

Dr. Frederick C. Pena
VPAA

Dr. Grant B. Cornell
VPPREP

RESEARCH SERVICES STAFF

Engr. Rogelio T. Mamaradlo
DIRECTOR

Mrs. Melchorita P. Alvior
EDUCATION PROGRAM SPECIALIST II
In-charge, Journal Reproduction

Engr. Antonio C. Lizada
EDUCATION PROGRAM SPECIALIST I
In-charge, DOST and IPO Phil Projects

Mr. Richard V. Evangelista
EDUCATION RESEARCH ASSISTANT I
In-charge, Journal Lay-out and Publication

Mr. Edgardo R. Sison
In-charge, Web Design / Development

Mr. Ervie Dumalaon
Student Assistant

EARIST Research Journal
Volume XVIII, No. 23 ISSN 0119-5212
JANUARY – JUNE 2018

Publication Board

Dr. Grant B. Cornell
Editor

Engr. Rogelio T. Mamaradlo
Associate Editor

Editorial Board
Dr. Marlene M. Monterona
Engr. Allan Q. Quismundo
Dr. Jesus S. Paguigan
Dr. Eriberto R. Astorga, Jr.

Secretariat
Mrs. Melchorita P. Alvior
Engr. Antonio C. Lizada

Circulation Manager/Lay-Out Artist
Mr. Richard V. Evangelista

Lay-Out Artist
Mr. Edgardo R. Sison

® All Rights Reserved 2018

Polytechnic University of the Philippines

EULOGIO "AMANG" RODRIGUEZ INSTITUTE OF SCIENCE AND TECHNOLOGY

Nagtahan, Sampaloc, Manila

The EARIST Innovation and Technology Support Office (EARIST-ITSO) is one of the franchise patent libraries of the Intellectual Property Office, Philippines (IPO-Phil). Its main objective is to advocate the protection of intellectual property on the academe sector. Its strategy is to have a demystified, democratized, and development-oriented patent system, easy to understand by technical people and laymen, to remove the fear of disclosing their intellectual property and eventually, registering them for their own protection.

A demystified patent system is evidenced by the fact that majority of the knowledge generators, researchers, and R and D proponents in the country know how to access global scientific and technology information through the patent databases, and when they wish to protect their innovations, they will know how to obtain patents.

A democratized patent system means that patents is an interdisciplinary concern involving business, researchers, engineering, scientists, faculty, students, government, lawyers, and other professions, who will know about and use the patent information, engage in patenting activities and participate in technology commercialization.

A development-oriented patent system implies that the patent system is fashioned as an effective tool to bring progress and prosperity, purposely tailored-fit to the particular needs of, and readily accessible by those who want to use patent information and obtain patents.

Services Offered:

- [illegible]
- [illegible]
- [illegible]
- [illegible]

[illegible]

[illegible]