



26<sup>th</sup> World Conference on Applied Science, Engineering  
and Technology  
(WCASET)



Manila, Philippines  
26<sup>th</sup> - 27<sup>th</sup> February 2020

Organized by  
Institute For Engineering Research and Publication

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## Preface

We cordially invite you to attend the **26<sup>th</sup> World Conference on Applied Science, Engineering and Technology (26<sup>th</sup> WCASET)** which will be held at **St Giles Makati - A St Giles Hotel, Manila, Philippine** on **February 26<sup>th</sup> - 27<sup>th</sup>, 2020**. The main objective of **WCASET** is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in relevant fields of Science, Engineering, Management, Education and Technology. This conference will provide opportunities for the delegates to exchange new ideas and experience face to face, to establish business or research relationship and to find global partners for future collaboration.

These proceedings collect the up-to-date, comprehensive and worldwide state-of-art knowledge on cutting edge development of academia as well as industries. All accepted papers were subjected to strict peer-reviewing by a panel of expert referees. The papers have been selected for these proceedings because of their quality and the relevance to the conference. We hope these proceedings will not only provide the readers a broad overview of the latest research results but also will provide the readers a valuable summary and reference in these fields.

The conference is supported by many universities, research institutes and colleges. Many professors played an important role in the successful holding of the conference, so we would like to take this opportunity to express our sincere gratitude and highest respects to them. They have worked very hard in reviewing papers and making valuable suggestions for the authors to improve their work. We also would like to express our gratitude to the external reviewers, for providing extra help in the review process, and to the authors for contributing their research result to the conference.

Since December 2019, the Organizing Committees have received more than 180 manuscript papers, and the papers cover all the aspects in Electronics, Computer Science, Information Technology, Science Engineering, Management, Education and Technology. Finally, after review, about 80 papers were included to the proceedings of **26<sup>th</sup> WCASET - 2020**.

We would like to extend our appreciation to all participants in the conference for their great contribution to the success of **26<sup>th</sup> WCASET-2020**. We would like to thank the keynote and individual speakers and all participating authors for their hard work and time. We also sincerely appreciate the work by the technical program committee and all reviewers, whose contributions made this conference possible. We would like to extend our thanks to all the referees for their constructive comments on all papers; especially, we would like to thank to organizing committee for their hard work.



**Rudra Bhanu Satpathy**

**CEO**

**Institute for Engineering Research and Publication (IFERP)**



## **Acknowledgement**

IFERP is hosting the **26<sup>th</sup> World Conference on Applied Science, Engineering and Technology** this year in month of February. The main objective of 26<sup>th</sup> WCASET is to grant the amazing opportunity to learn about groundbreaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points, and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions. The sessions serve as an excellent opportunity to soak up information from widely respected experts. Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and become known as a thought leader.

I express my hearty gratitude to all my Colleagues, staffs, Professors, reviewers and members of organizing committee for their hearty and dedicated support to make this conference successful. I am also thankful to all our delegates for their pain staking effort to travel such a long distance to attain this conference.



**A. Siddh Kumar Chhajjer**  
**Director**  
**Institute for Engineering Research and Publication (IFERP)**



## **Message from Keynote Speaker**



### **Echel S. Antero**

Vice President for Academic Affairs (VPAA)

First City Presidential College

Philippines

Greetings of peace to all

The 26<sup>th</sup> World Conference on Applied Science, Engineering and Technology continues to be a prolific platform for sharing recent research and cutting edge technology. It is indeed my honor and privilege to welcome the community of researchers, delegates, scholars and guests to this prestigious event.

A handwritten signature in black ink, appearing to read 'Echel S. Antero', written in a cursive style.

**Echel S. Antero**





## Message from Keynote Speaker



### **Jackie Domondon Urrutia**

Director, Research Management Office

Polytechnic University of the Philippines

Philippines

It is my great pleasure and honor to welcome all the guest, research presenters and participants to the “**26th World Conference on Applied Science Engineering and Technology (26th - WCASET)**).

My warmest and heartfelt congratulations to the strong men and women of **Institute for Engineering Research and Publication (IFERP)** as you bring together the members of the academe, innovators, researchers, academicians, scientists, students and global experts to share the latest knowledge in the field of applied science, technology, mathematics and engineering. I would like also to extend my gratitude to all the delegates especially those who travelled limitless distances to visit our lovely city, Manila, Philippines.

This year theme "**Technological Developments & Modern Trends in Applied Science and Advanced Engineering**" will provide them the venue to exchange research findings that is crucial in the implementing of projects that can change the nation, to interact with fellow knowledge workers for a greater collaboration and to explore ways to bridge the gap towards competitiveness that will lead to effective solutions relevant in building more sustainable future and for the improved of Humanity.

On behalf of the Office of the Vice President for Research, Extension, and Development, Polytechnic University of the Philippines, I would like to express my deepest appreciation to the commitment of the Organizing Committees in making WCASET 2020 a success.

Congratulations and welcome to Manila, Philippines

A handwritten signature in black ink, consisting of a large, stylized loop at the top and a horizontal line at the bottom, with a vertical stroke intersecting the horizontal line.

**Jackie D. Urrutia, Ph.D.**



## **Message from Keynote Speaker**



**Elenita M. Tiamzon**

Research Director

World Citi Colleges (WCC)

Philippines

Welcome to the **26<sup>th</sup> World Conference on Applied Science, Engineering and Technology**, a unique conference aimed at bringing together the academicians, scientists, and research scholars to share and disseminate information on knowledge and scientific research works related to multidisciplinary topics and confer the practical challenges encountered and the solutions adopted (WCASET).

Let me thank the host, Institute for Engineering Research and Publication (IFERP) and the co-hosts universities and colleges of the Philippines for having brought us together here in the city of Makati-Philippines, the Pearl of the Orient.

For more in-depth study of selected areas, the conference will include speeches given by the experts, presentation of researchers on every field of expertise, and provision for exchange of ideas on latest research, technologies and applications. We hope that you will enjoy, learn, and participate in the lively debate with your peers.

A handwritten signature in black ink, appearing to read 'EM Tiamzon'.

**Elenita M. Tiamzon**



# Organizing Committee

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**WCASET - 2020**

**26<sup>th</sup> World Conference on  
Applied Science, Engineering  
and Technology**

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26<sup>th</sup> – 27<sup>th</sup> February, 2020**

# **ABSTRACTS**

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**26<sup>th</sup> WCASET - 2020**

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# Hybrid Levenberg-Marquardt Artificial Neural Network Model: A Genetic Algorithm for Multi-Objective Strength Optimization and Parametric Analysis of Concrete with Surkhi and Corypha Utan Lam Fiber

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## ***Abstract:--***

Fiber-reinforced concrete (FRC) is one efficient innovation in concrete industry that has the ability to enhance the mechanical properties significantly. Rapid industrialization and urbanization caused a sudden boom in the construction industry resulting to an increase in infrastructural activities which resulted in greater demand in production of different construction materials which have a negative impact on the environment. This study aims to determine the mechanical performance of the optimum compressive and flexural strength of buntal fiber-reinforced concrete with surkhi as partial replacement for sand (BFRC-SS). Using 28th-day compressive and flexural strength, several mixtures were experimentally tested to derive a mix proportion that will give the best mechanical properties of BFRC-SS. From the results, best hybrid models of compressive and flexural strength were formulated using Artificial Neural Network (ANN). Parametric studies were conducted to show the individual effects of surkhi and buntal. Numerical analysis and graphical results showed the behavioral trends of varying values of material components by holding one variable to minimum, maximum and mean value at a time. Results showed that ANN was able to establish the effects of surkhi and buntal (Corypha utan Lam) fiber to the mechanical properties of BFRC-SS. Furthermore, the multi-objective Genetic Algorithm (GA) model generated the optimum proportion for the best compressive and flexural strength. Parametric analysis showed a constitutive relationship between material components and mechanical properties of concrete. Fuzzy Inference System (FIS) and Multi-Linear Regression Analysis (MLRA) were also utilized to assess and validate the hybrid model through surface imaging. Utilizing least percent error, ANN hybrid model showed the most significant predictive model compared to other models generated by MLRA and FIS. To protect intellectual property, and to ensure the exclusive right of the authors, the validated hybrid model generated from ANN and multi objective GA was copyright protected. Adopting the fusion of 4.0 Industrial Revolution and favoring creativity towards sustainable development and integrity through artificial intelligence.

## ***Index Terms***

Surkhi, Buntal Fiber, Artificial Neural Network, Multi-Objective Genetic Algorithm, Parametric Testing, Fuzzy-Inference System, Multi-Linear Regression Analysis

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# An Assessment: Respiratory Analysis Using Data Mining Method - A Decision Support System

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***Abstract:--***

The purpose of the study is to provide an aid to clinicians in making sound decision with the help of the Clinical Decision Support System. The proposed system aims to offer fast data analysis technique in order to make reliable predictions based on the stored data in the developed system. The prediction is based on regression analysis, a common way of generating prediction based on the data available. The main feature of the study concerns the capacity of Clinical Decision Support System in providing predictions in order to see possible future problems or course of actions needed to address. The proposed developed system addressed the problems encountered by providing fast data analysis technique to make reliable predictions. Decision making is now easier to the management (Physicians and Nurses) when using the system. Moreover, timeliness of record's summary provides instant result of the current medical records, provide analysis of the past records and its main feature: to offer predictions based on the records stored and analyzed by the system.

***Keywords:***

Decision Support System, Data Mining, Prediction, Predictive Analysis

# The Measurement Comparison between Hadlock and Hadlock 4 Formulas in the Second and Third Trimesters Obstetric Ultrasound for Foetal Weight and Delivery Estimation

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## ***Abstract:--***

This research aims to analyze the results of Hadlock and Hadlock 4 formulation measurement on pregnant women in the second and third semester obstetric ultrasound scan for foetal weight and delivery estimation. The design of this research is quantitative analytic. Data analysis was done by T-Test. This research was conducted from October to November 2019. The population of this research was taken from the entire number of Obyn ultrasound examinations and 30 research samples. Based on the research, it can be concluded that an analysis of the estimated labor time with the Hadlock and Hadlock 4 obtained the results of \*Tbirth-2 with an average labor time of 34.40 days while \*Tbirth-4 is 40.87 days. There is a difference in the Sig. (2-tailed) value of 0,000 <0.05. From this result Ho was rejected and Ha was accepted which means there is a difference between the estimated delivery time based on the Hadlock and Hadlock 4 formulas. Estimated foetal weight with Hadlock and Hadlock 4 formula obtained \*\*TFW-2 results with an average fetus weight of 2477.07 grams while \*\*TFW-4 is 2416.80 grams with Sig value (2-tailed) of 0.000 <0.05 means that there are differences between estimated foetal weight based on Hadlock and Hadlock 4.

## ***Index Terms***

Ultrasound, Hadlock, Hadlock 4, foetal weight, delivery

# Empirical Correlations between Shear Strength Parameters and Slope Angle

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***Abstract:--***

Empirical correlation serves as a guide for designers especially if there are urgent works that need to be done and a limited time to conduct extensive laboratory tests. This study defines the procedures and analysis used in order to evaluate the validity of the existing empirical correlation between the shear strength parameters i.e. cohesion and angle of friction with the slope angle by increasing the number of data points. Throughout the study, an additional of 20 sampling points were added and the soil samples were delivered to the soil laboratory for various tests such as grain size analysis, fall cone test, and direct shear test. The obtained slope angle values from field investigation and the data from laboratory testing were then analyzed and correlated. The results correlations from regression analysis showed that the coefficient of determination,  $R^2$ , for cohesion-slope angle and friction angle-slope angle were found to be 0.064 and 0.019, respectively, using the power series model. The values imply that there is no conclusive correlation evidence that the cohesion and angle of friction of the soil can be predicted through its respective slope angle.

***Keywords:***

Cohesion, Friction Angle, Correlation, Slope Angle, Regression Analysis

# MATLAB-Based Coconut Maturity Classifier using Audio and Image Processing

## Coconut Maturity Classifier

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### ***Abstract:--***

A key phase in the post-harvest process of a coconut is its classification according to age or stage of development. Currently, the manual tapping method, as well as using the coconut's exterior appearance as basis, is a customary practice among sellers to determine the fruit's age. However, both have drawbacks when it comes to accuracy, as retailers have noted losses in income because these methods do not guarantee correctly classified coconuts. To address this concern, a coconut maturity classifier that uses MATLAB for processing the fruit's thermal image and audio, produced by a mechanical tapper, was developed. After a series of tests, the proponents were able to develop a system that has an accuracy rate of 93.33% for audio and 60% for image. For the execution time, it takes an average of 75.37 seconds to complete the whole process. The user-friendly rating of the system is 4.62.

### ***Keywords:***

Coconut Maturity Classifier, Audio Processing, Image Processing, Thermal Imaging, MATLAB, Fast Fourier Transform

# Basic Emotion Recognition System for persons with Amyotrophic Lateral Sclerosis using Electroencephalography

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## ***Abstract:--***

Amyotrophic Lateral Sclerosis (ALS) is a progressive neurodegenerative disorder that causes the death of motor neurons making the person unable to speak and move. An EEG device will be used to record the brain activity of the user especially the emotions which were classified into three: the happy, sad and angry. The brain signals will be stored to be used as data. The method consists of pre-processing, amplification of the raw EEG signal and filtering. The filtered EEG signals will then undergo feature extraction to extract and determine the fundamental frequency components of the signal. The extracted frequency parameters will be the input for signal classification that will differentiate the three emotions. This study shows that the system achieved a 93.33% accuracy for happy emotion; 86.66% for sad; and 83.33% for angry detection, certainly proving to have a good score and beneficial utility for the recognition of emotion through EEG.

## ***Index Terms:--***

emotion recognition, electroencephalography, EEG, Fast Fourier Transform, FFT, Brain Computer Interface, BCI.



## Entrepreneurship: Risk mitigation strategy

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**Do Thi Phi Hoai**, Academy of Finance

***Abstract:--***

Business intentions are motivational factors that drive individuals to pursue business results. With a feasible and desirable business mission, the intention becomes stronger than ever. That's entrepreneurship. Business start-ups and innovations play a very important role in the development of society by creating jobs, transforming the economy and society in a positive way, helping the poor become rich, etc.

In fact, the success rate of start-ups is not high for many reasons, ranging from the entrepreneur, business capacity and market context. The theoretical framework of entrepreneurship should be the basis for the business success of any entrepreneurs, and risk mitigation strategies are among the foci for any new business.

***Keywords:***

Entrepreneur, Entrepreneurship, Risk, Creativity, Success

# Exploration of the Lived Experience of Micro Entrepreneurs in the Food Processing Business Using a Phenomenological Approach

**Gerry Z. Laggui**, Associate Professor II, Institute of Business Management, Isabela State University, Cabagan, Isabela, Philippines

***Abstract:--***

Entrepreneurship is not just a business but a state of mind and it is often touted as the best way to live a life. The entrepreneur often wears many hats and lay out the plans and pursue the steps needed to make the business a success. On the other hand, entrepreneur faces tremendous challenges as he operates his business. The number of entrepreneurs has risen and the numbers are continuously growing. However, there is a scarcity of qualitative literature on lived experiences of micro entrepreneurs in the food processing business. Hence, this study aimed to determine what are the lived experiences and personal competencies of micro entrepreneurs and how do they cope with the demands and challenges in the food processing business in the province of Isabela, Philippines. The study employed an in-depth semi-structured survey questionnaire and conducted with 15 participants who had operated a food processing enterprises for 5 years or more. The design of the study is psychological phenomenology. The research study concludes that the success of an entrepreneur can be contributed to his entrepreneurial competencies which may be innate to him, enhanced from learnings or derived inspirations from experiences of other successful entrepreneurs. Also, the entrepreneurs recognized that there is a divine intervention in their business endeavors because of their faith to God. Finally, entrepreneurs are personally driven by their passion to persevere and love what they do

***Keywords:***

micro entrepreneur, food processing and psychological phenomenology

# Factors Hindering the Behavior of Purchasing Hygiene and Safe Food by Residents of Metropolitan Areas in Vietnam

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**Duong Thi Hoa**, National Economics University, Vietnam

## ***Abstract:--***

The paper aims to identify and measure the impact of hindering factors to the behavior of purchasing hygiene and safe food of people in Vietnamese cities, and to propose solutions to lessen and eliminate those factors, promoting the buying behavior of the consumers, therefore contributing to the growth of hygiene and safe food production and consumption in Vietnam urbans.

The group of authors build research model; set up scales and questionnaires; apply qualitative and quantitative methods to collect data from a number of producers, distributors and survey 538 people as end-users; measure the impact of factors hindering the behavior of purchasing hygiene and safe food of people in the socio-economic conditions of urban cities. The research results show a general picture of the actual situation of buying behavior and factors that hinder the behavior of purchasing and consuming hygiene and safe food; focusing on 8 groups of issues: (i) Health and food concerns; (ii) Issues of knowledge, understanding and mentality; (iii) Social communication; (iv) Packaging and branding; (v) Socio-cultural factors and personal experience; (vi) Price; (vii) Availability, distribution, convenience; (viii) Quality. On that basis, the research team proposes orientations and solutions for hygiene and safe food businesses in areas such as marketing, communication and branding, as well as for state management agencies in areas such as communication and food supply chain management. The authors expect with the proposed solutions, the purchase and consumption of hygiene and safe food, in general and the urban areas in particular, will be promoted; thereby encouraging hygiene and safe food production and distribution, contributing to sustainable socio-economic development in Vietnam.

## ***Keywords:***

Hygiene, Clean and Safe food, hindering factors of buying behavior, Vietnam cities

# Analysis of Anti-Intrusion of Saline Water Well Using Sunjoto's Method

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## ***Abstract:--***

Coastal area was a place which are occupied since the beginning of civilization movement caused by this place contain fresh water especially in the sandy beach. In this area fresh water can be exploited easily by swallow dug well. But in modern era, this place changes become dense population area and as a consequent the saline water intrusion occurs due to the extraction of fresh water. The saline water intrusion occurs in many places of Indonesia for example it reaches the area of Monas in Jakarta, the saline water intrusion in city of Merauke caused by the over drainage of swamp area. This problem occurs when groundwater storage decrease caused by the decreasing of rain water infiltration to the ground and the exploitation groundwater increases. According to Ghijben-Herzberg relationship that the border of saline water and fresh water will increase about 40 times of decreasing groundwater surface and as a consequent the groundwater storage changes become brackish or salty. This system was proposed as a model of anti-saline water intrusion well which was called 'Coastal Fresh Water Optimal Well' which was tested in Biak island, and they proved that this design is appropriate for the coastal area fresh water withdrawal but there is not computation of this system. In this paper the sustainability design can be analyzed using parameters of depth of fresh water storage and up coning. Up-coning depends drawdown and drawdown depends on discharge of pumping, coefficient of permeability of soil and shape factor of well.

## ***Index Terms***

Discharge, Intrusion, Shape Factor, Up Coning

## Microwave assisted drying of stingless bee (*tetragonula biroi*) pollens

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### **Abstract:--**

The main objective of the study was to evaluate the effect of microwave drying to the quality of stingless bee pollens. A microwave oven was modified to have an air circulating facility for drying purposes. Fresh bee pollens were analyzed for baseline data. The bee pollens were microwave dried in different power outputs (119W, 336W, and 700W), and then these were characterized to determine the drying characteristics and changes in its quality.

The microwave dryer has an overall dimension of 300 x 450 x 500mm (LxWxH). Results showed that 700W power output has the best performance compared to 336W and 119W in terms of drying time (5 mins), drying capacity (1.8kg/hr), and moisture reduction rate (108.421%/hr).

Based on the analysis, fresh bee pollens has 12.07% moisture, pH of 4.04, water activity of 0.622, 16% w/w of protein, 1.1mg/100g of vitamin E, and 0.118mg/100g of  $\beta$ -carotene. After drying, the 336W treatment has the highest protein content of 16.3% w/w compared to 700W with 16.1% w/w. In vitamin E, 119W has 0.95mg/100g which was lower than the value of fresh samples while in 700W and 336W, vitamin E increases with 2.8 and 1.7mg/100g, respectively. All treatments show an increase in  $\beta$ -carotene with 700W as the highest (0.226mg/100g) and 336W with the lowest (0.174mg/100g).

### **Keywords:**

Drying, Microwave, Pollen, Stingless Bee

## Measuring Tourists' Emotional Experiences toward the volunteer tourism in Ta Van - Sa Pa – Lao Cai - Vietnam

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**Nguyen Thi Phuong Nga**, Tourism Department, Hanoi University of Industry

**Bui Phu My**, Tourism Department, Hanoi University of Industry

### ***Abstract:--***

Positive emotions plays important role in shaping tourist experiences toward a destination. Applying DES (Destination Emotion Scale), this study measure tourist's emotion toward the volunteering tourism in Ta Van. The study uses data collected from 239 random national tourists in the age of 20 to 40 who participate in the volunteer tourism in this area. The survey shows that 51% of tourists having positive emotion with this type of tourism. Things that inspire tourists include: ethnic culture experience, supporting activities for locality and the friendly of people there. The results of this study are basis to propose solutions to improve the tourist experience of this type of tourism to Ta Van destination, thereby increasing their intention to return or recommend the destination to other travelers.

### ***Key Words:***

Destination Emotion Scale, tourist's emotional experiences, volunteer tourism, Ta Van.

# College Dropout Prediction Model Using Supervised Machine Learning

**Diosdado C. Caronongan**, University of Luzon, Philippines

## ***Abstract:--***

The highly competitive nature of business requires each corporation to analyze its data to understand customer behavior patterns. Accordingly, in the education sector, analyzing dropout data will help schools better understand student behavior. Education statistics show that foreign as well as local educational institutions are experiencing an alarmingly high dropout rates. Thus, a school equipped with a tool that can predict a dropout, will have a competitive advantage since it can timely prescribe needed programs of intervention that could prevent dropping out from happening.

This research work aimed to develop dropout prediction models using the two main types of supervised machine learning – Classification Method and Regression Method. The dataset used in the study are based on the academic records of 687 Information Technology and Computer Science students who are enrolled at University of Luzon, Dagupan City Philippines.

Using the combination of accuracy, precision, recall and F measure metrics, the study compared the prediction performances of the two supervised learning models and determined the better solution. Likewise, the effect of feature engineering on the performances of the prediction models were measured and determined. Moreover, a web-based dropout prediction system was developed and deployed using the Shiny package framework.

## ***Index Terms***

College Dropout Prediction, Supervised Machine Learning, Classification Method, Regression Method.

# Entry Competencies and Performance in Mathematics of First Year Engineering Students in State Universities in Region 3

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**Gener s. Subia**, Vellore Institute of Technology

**Philip P. Ermita**, Vellore Institute of Technology

## ***Abstract:--***

This study was conducted to explore the entry competencies and performance in Mathematics of first-year engineering students in state technological universities in Region 3 in the Philippines. It utilized descriptive-correlational research design using researcher-made-tests as instruments of the study.

The respondents scored average in the test in General Mathematics and below average in Probability and Statistics, Pre-Calculus and Basic Calculus. Overall, the entry competency in Mathematics of first-year engineering students is low. As to the respondents' performance in Engineering Mathematics, they are at an average level. Additionally, those students with high entry competencies in mathematics performed better in their engineering math.

Based on the findings and conclusions the following are recommended and offered by the researcher: senior high school mathematics teachers may teach Probability and Statistics, Pre-Calculus and Basic Calculus the way it may be easily learned and understood by their students. They may consider applying effective strategies for each subject that will make the students engaged in the teaching and learning process. Likewise, Engineering Mathematics Test (EMT) developed by the researchers may be adopted by the deans of the College of Engineering to be their instrument in choosing students who want to enroll in the said course.

## ***Index Terms:--***

Calculus, Civil Engineering, Electrical Engineering, Mathematics, Mechanical Engineering, Probability and Statistics



# Integrated Cloud Security Model for Cloud Based Power Monitoring Environment

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**Thelma Palaoag**, University of the Cordilleras, Baguio City, Philippines

***Abstract:--***

Cloud Computing (CC) is the on - demand delivery of computing power, database storage, applications, and other IT resources via pay as you go internet cloud services platform. Due to its various advantages, CC is taking center stage in electrical power providers. However, security threats and attacks are mostly one of the problems due to CC's popularity in electrical grid agencies. The main objective of this study is to propose a security model that would prevent threats and attacks in cloud based power monitoring platform. Due to the lack of resources to gather data regarding common threats and attack in cloud based power monitoring, the researchers used Systematic Literature Review (SLR) as the method to come up with the appropriate solution for the proposed security model. Dedicated server deployment model was also used to create the proposed security model. Experts in the field of network security and smart system verified the acceptability of the proposed security model if it is feasible to use in cloud based power monitoring systems.

***Keywords:***

Cloud Computing, power monitoring, security attack, security threats

## Internet Usage and Economic Growth Nexus: Evidence from a Panel of GCC Countries

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**Dr. Ahmed Yass Algrari**, Lecturer at Department of accounting, college of Administration and Financial Sciences, Chihan university Sulaimani, Sulaimaniya-Kurdistan Region, Iraq.

### ***Abstract:--***

This paper aims to investigate the long-run relationship between Internet usage and economic growth in Gulf Cooperation Council countries (GCC) for the period of 15 years from 2003 to 2017, within panel data framework. The analysis was conducted using Dynamic Ordinary Least Squares (DOLS) and Fully Modified Ordinary Least Squares (FMOLS) approaches.

The long-run panel estimates indicate that Internet usage has a positive and significant impact on economic growth. Moreover, the close values of long-run coefficients for all estimations confirm the robustness of the estimated results. The empirical results reveal that internet usage promotes economic growth in the GCC countries.

### ***Key Words:***

Panel data, Internet usage, Economic growth, GCC FMOLS, DOLS.

# Evaluation and Analysis of the Use of Frequent Flyer Program (Case Study: Garuda Indonesia Frequent Flyer Program)

**Ahmad Munawar**, Center for Transportation and Logistic Studies (PUSTRAL) Gadjah Mada University

**Dian Virda Sejati**, Center for Transportation and Logistic Studies (PUSTRAL) Gadjah Mada University

## ***Abstract:--***

Garuda Frequent Flyer (GFF) is a regular frequent flyer program of PT. Garuda Indonesia, with membership level divided into four, those are Blue, Silver, Gold and Platinum. Based on the development and consistency of GFF program in Indonesian aviation, this study intends to investigate the characteristics the members of the GFF, then analyze and evaluate the GFF program impacts on the increasing of passenger Garuda Indonesia and examines the factors that may distinguish the level of membership in this program.

This research was conducted by distributing questionnaires at Soekarno- Hatta Airport with a total number of respondents as many as 400 people. Questionnaires are about the identity of respondents and questions related to the purpose of research. The questionnaire answer will be analyzed with SPSS software using simple regression and Multiple Discriminant Analysis (MDA).

The study results show the average number of passengers Garuda Indonesia is significantly different before and after there GFF program. Furthermore, by simple regression test, known  $R^2 = 0.855$  which means 85.5% variation of the dependent variable (number of passengers Garuda Indonesia) can be explained by independent variables (number of members of the GFF program). Whereas Multiple Discriminant Analysis can form three discriminant models which final result showed that the level of membership in the GFF program is distinguished by a variable frequency of flights, travel destination for business/job and a ticket costs incurred by the company/office.

## ***Keyword:--***

Frequent Flyer, Multiple Discriminant Analysis, Membership Level, Ticket Cost

## Regulatory Office's Non-Decision to Business Plan and its Subsequent Implications for a Water Concessionaire

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**Wilfredo L. Infante**, Mechanical Engineering Department, Holy Angel University, Angeles City, Philippines

**Vivian E. Gutierrez**, Graduate School of Engineering, Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines

**Rex Mervin P. Ramos**, Graduate School of Engineering, Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines

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### ***Abstract:--***

The Company under study is currently on its 3rd year of its Rate Rebasing (RR) process. Considering the time stretch, one may think the process would be skewed towards resolution, however, the Regulatory Office (RO) is mum on the topic and haven't released a decision on tariff adjustments. Water rates have been put in status quo. The Company was forced to operate in bare minimum OPEX. CAPEX was also put on hold. To show the subsequent implications, the researcher gathered data from the Company's Key Departments. This provided a glimpse on what the Company's service quality be like in the next 5 years along with its forecasted financial position.

The study has shown the challenges faced by the private concessionaire. Given the circumstance, it cannot sustain excellent performance and its services will eventually deteriorate: Water pressure, water quality, water security, power efficiency, including Non-Revenue Water (NRW) are expected to drop as early as 2021. There will also be noncompliance for the new wastewater standards. For financials: Gross Profit and EBITDA margins will decrease in percentages. Amortization will increase in value due to the existence of increasing loans payable. Cash and cash equivalents will not be enough to support the direct cost and direct labor as well as the loans payable. The Company will not be liquid to pay for liabilities. After 2025, the Company may operate at a loss unless some costs are cut down or some assets be sold. Status quo will eventually translate to deteriorated service and possible bankruptcy.

### ***Keywords:***

Arbitration, Public Private Partnership, PPP, rate rebasing, water tariff, water concessionaire

## An E-Learning Module in Dressmaking National Certificate II

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***Abstract:--***

This study focused on the development of An E-learning Module for Dressmaking NC II with a teacher's guide using the ADDIE mode I(Analysis, Design, Development, Implementation and Evaluation). The ADDIE Model is a systematic method for putting various teaching tools in place to create an overall approach to individual lessons and subject matter. Understanding the ADDIE Model helps create a better training material that suits the target audience. The stages that were undertaken by the researcher are Analysis, Design, Development, Implementation and Evaluation. These stages helped the researcher to come up with an instructional material that suits the learners. Prior to the design and development of the E-Learning Module for Dressmaking NC II, appropriate documents were considered to determine its content. The researcher, during the Analysis Stage, identified important components that are necessary to be addressed. Also, the relevant materials that are needed to be utilized so as to comply with the TESDA requirements such the existing learning materials that are available to the learners, K- 12 Competency-Based Curriculum Guide for NC-II in Dressmaking, the Training Regulation Manual and other resources were gathered and analyzed. A validated questionnaire was utilized in order for the respondents to evaluate the acceptability of the E-Learning Module in terms of its content validity and acceptability criteria. The findings of this study proved that the developed E-Learning Module for Dressmaking NC II is highly acceptable in terms of content validity and acceptability as assessed by the teachers and TESDA assessors, and the composite means gleaned are 4.70 and 4.69, respectively. Further, there is no significant difference between the assessment of the teachers and the TESDA assessors. Moreover, the curriculum planners may use the findings and the output of this study in planning varied instructional materials that will be used by dressmaking teachers in order to provide foster quality education.

# Student Attendance Management System Using QR Codes in Romblon State University-Cajidiocan Campus

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## ***Abstract:--***

Checking students' attendance can be done used technology to improve it from manual tasks to automated. Attendance management system is an automated process of taking attendance that helps the school in generating attendance report. This paper proposes a system that is based on a QR code provided by the system that can be used by the students before or during the lectures. The system generates QR codes that contain the information of the course, section, subjects, date, and IN/OUT. The students will need to scan the QR code using their mobile phones and send them to the server in order to confirm their attendance. It requires the students to capture and send their facial images to be stored in the database. The system generates summary reports of the students by subjects or by section every day or every end of the month to help the instructors and the school to provide a record of the students attendance. Using this system will minimize the use of paper. The students receive email notification/confirmation of successfully attending the class on a particular date.

## ***Index Terms:***

Mobile Phone; QR Codes; Student Attendance Management System; Notification; Summary Reports.

# Smart Microclimate Controller for Propagation Greenhouse on Growing New Plants from Seeds

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**Thelma D. Palaoag**, University of the Cordilleras, Philippines

## ***Abstract:--***

Greenhouse provides a stable environment for seeds that are typically started in seedling trays by regulating the soil moisture, temperature, and humidity for seedling production at any time. Production of new plants from seeds in the propagation greenhouse proliferates a large number of plants in a short period, however, environmental factors affect the germination and growth stage of the seedlings. The Internet of Things is growing with its emerging sensor devices offering extraordinary approaches to improve agricultural productivity. In this study, it focuses on growing new plants from seeds using a microclimate controller for propagation greenhouse. The objectives of the study are: to design and develop a smart microclimate controller; to identify the appropriate threshold values of the microclimate parameters and; to evaluate the level of reliability of the smart microclimate controller. Using a survey questionnaire and face-to-face interview methods focused on greenhouses, propagation practices, and environmental conditions, substantial information was obtained from selected greenhouse technicians in the province of Isabela. The various practices were used to develop significant plans and specifications to regulate environment parameters. With the use of a smart microclimate controller along with a propagation greenhouse, the recorded daily average growth rate of seedlings produced is 0.83 cm equivalent to an average of 0.21 cm daily growth rate quicker than of the seedlings produced on traditional propagation greenhouse. Hence, the microclimate controller demonstrates a competitive means of growing new plants from seeds. Furthermore, it promotes quality production of seedlings on minimal supervision but delivers constant service efficiently.

## ***Index Terms—***

Agriculture, Microclimate Controller, Propagation Greenhouse, Seedling Production

# An Analysis on Noise Level Management in Engineering Building at UPHSD - Calamba

**Roselle P. Alviar**, Nueva Ecija University of Science and Technology.

**Edison M. Bengco**, Nueva Ecija University of Science and Technology.

**Johnny P. Belizar**, Nueva Ecija University of Science and Technology.

**Heherson Alcaraz**, Nueva Ecija University of Science and Technology.

**Ryan John L. De Lara**, Nueva Ecija University of Science and Technology.

**Noel T. Florencondia**, Nueva Ecija University of Science and Technology.

**Michael John M. Villar**, Nueva Ecija University of Science and Technology.

## ***Abstract:--***

This study endeavored to determine the impact of noise level to engineering students of University of Perpetual Help System Dalta (UPHSD) -Calamba, Laguna. The study was done by determining the sources of sound levels in engineering building and its effect to students in comparison to the standard noise criteria. Solutions and remedy to noise level in engineering building at UPHSD-Calamba was also considered.

This study relied on experimental and descriptive research method. Data were gathered through observation, interviews, selected readings and testing. The researchers chose the College of Engineering building as medium for testing sound level in comparison with the noise criteria standard.

The UPHSD – Calamba Engineering Building has an average noise level of 73.79dB. The classrooms were classified into tolerable within four (4) hours based on the Noise Mapping. Rooms at ground floors which are all laboratory rooms where the noise level were in the range of (45-85dB). Rooms located at the second floor from Room 6 to Room 9 are drafting rooms which were in the range of (50-76 dB) and Room 10 to Room 15 on the third floor are lecture rooms were in the range of (59-88dB). The highest noise brought on the ground floor was the noise of mechanical tools while on the second and third floor were caused by the students transferring to other classrooms. Classes from 7:00 a.m-8:30a.m. has a normal noise level while from 8:30 a.m. onwards has a tolerable range of four (4) hours. Some improvements are suggested to reduce the noise such as the reposition of windows, acoustic material to cover the classrooms' wall, as the barriers.

## ***Keywords:***

Noise level, decibel, acoustics, effective noise level



# Ergonomic Practices and Organizational Performance of Car Manufacturing Companies in Laguna

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**Juliet O. Niega**, Nueva Ecija University of Science and Technology.

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**Ryan John L. De Lara**, Nueva Ecija University of Science and Technology.

**Noel T. Florencondia**, Nueva Ecija University of Science and Technology.

**Michael John M. Villar**, Nueva Ecija University of Science and Technology.

## ***Abstract:--***

Scholars and renowned Ergonomist avowed that Ergonomic practices implementation leads to excellent organizational performance. This study sought to find relationship between Ergonomic practices and organizational performance. Four car manufacturing companies in Laguna participated in the research. Combination of Velasco's Ergo Tech Leap System Model and Shahnavaz's Theoretical Model for Ergonomic Intervention was used as the theoretic frame in the determining the relationship between Ergonomic practices and organizational performance. Research was pursued using Explanatory Mixed Method. Quantitative research made use of survey questionnaire. Demographic data were analyzed with the use of descriptive statistics in terms of mean and standard deviation. Pearson's Correlation was employed to test the relationship of the variables. In- depth interviews with manager and three supervisors were pursued in the qualitative research. Result revealed that there is a significant relationship between Ergonomic practices and organizational performance. Companies are strong in the implementation and commitment to safety and served as an avenue that provides safety trainings, skills formation, seminars, education and competition for personal growth and organizational growth. Company representatives believed on the positive outcome they will reap upon implementing these practices. Thus, lack of top management support pinpointed as the lead barrier to successful implementation of Ergonomic intervention. Government regulation and market condition only shared small percentage of the barrier.

## ***Keyword—***

Ergonomic practices, organizational performance, workers' productivity, organizational productivity, workers' health and safety, quality of a product.

# Levenberg-Marquardt Algorithm Based Neural Network Model for Predicting Licensure Examination Performance of Civil Engineering Students

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**Kevin Lawrence M. De Jesus**, Department of Civil Engineering, FEU Institute of Technology

## ***Abstract:--***

In the onset of the 4th Industrial revolution, wherein the use of artificial intelligence is mushrooming in research, the Artificial Neural Network (ANN) algorithm has become an advanced tool when it comes to building of performance models. This study utilizes ANN using MATLAB to create a model that can predict the performance of civil engineering students in the Licensure Examination.

Employing educational data mining techniques, the ANN model output could identify the student's performance in the Licensure Examination for Civil Engineering. The ANN models utilized Feed – Forward Back Propagation and Levenberg-Marquardt algorithm due to its simplicity and wide array of use. The utilization of the samples was distributed into three phases: training, validation and testing phase. Three (3) licensure examination periods were used for the creation of the prediction models from 2011, 2015 and 2018. The basis for the selection of the chosen periods was based on the change in the number of items in the licensure examination from 30 to 100 to 50 items. The input parameters were the student's academic performance in the different subjects divided into three categories patterned from the licensure examination criteria. The output used in modelling is the respondents' board examination score. From the data gathered, three (3) models were created for the three (3) civil engineering board exam subject areas..

Higher Education Institutions (HEIs) will be guided in determining the student's predicted performance and to carry out measures to give priority to the low performers. The identified civil engineering students should be given higher priority during the conduct of major and correlation courses in their terminal year. The early prediction data can help institutions to implement solution to improve the actual performance during licensure examinations. Using the output models and equations, the students can easily identify their predicted licensure examination performance integrating their academic records from the school and likely will give them proper motivation to improve.

## ***Index Terms***

Civil Engineering, Licensure Examination, Neural Network Model, Prediction Model.

## Gap Refinement of Teaching and Learning Practice in Digital Era via Informal Guidance

**Revathi Sagadavan**, INTI International University, Malaysia.

**Shiney John**, INTI International University, Malaysia

***Abstract:--***

Digitalization era leads to short concentration span and memoryless learners, as the whole world is in their hand in the form of gadgets and the internet. In such a situation, mismatching of coaching style of an educator and learning preferences of a student can lead to an ineffective learning experience. This paper is an attempt to explain the shift in learning preferences of the current younger generation. Educators need to acknowledge this issue to ensure the effective teaching and learning experience achieved and the gap between students and instructor refined. To achieve this objective, the Index of Learning Styles (ILS) questionnaire is adapted with addition of a few questions to understand the students learning preferences. The data were collected from a sample of 1089 respondents from Malaysia, China and Indonesia. The results reveal that majority of the students are in the visual category and they prefer informal guidance through social media channels.

***Index Terms:***

Digitalization, learning preferences, visual learners, social media, accountability.

## Factors affecting intention to use green containers for shopping of Vietnamese urban consumers

**Le Thuy Huong**, National Economic University

**Phan Thanh Hung**, University of Labor and Social Affair

***Abstract:--***

This study examines the intention of Vietnamese urban consumers to choose green container to replace throw away plastic bags as shopping packages, in the context that Vietnam is one of the countries that dispose plastic waste most. The study selects the technology-accepting model (TAM) as the research framework, and extends this model by adding some characteristic variables of consumers from countries with transition economies such as Vietnam. The results show that Sense of ease in use, Sense of the usefulness of throw away plastic bags, Inability of alternative products to be hindering factors, while Perception of modern self is a factor promoting the intention to use green container instead of plastic bags.

***Keywords***

Green consumption, green container, throw away plastic bag, TAM, Vietnamese consumer.

## Soil Moisture Monitoring System

**Christopher H. Guiang**, Isabela State University

***Abstract:--***

The “Soil Moisture Monitoring System” was developed for farmers in the greenhouse. The said scheme will automatically detect the level of soil moisture, distribute the correct quantity of water to the crops, and directly send information to the user's device to view prior and current information.

The project aims to reduce the inappropriate use of water, automated monitoring of soil moisture and irrigation can reduce manpower, workload, time and effort. This battery-driven system is regulated by a microcontroller. The microcontroller is linked to the GSM module, enabling the system to interact via a mobile phone.

The researcher used Agile Software Development Life Cycle. The researchers used this method to collect data through observation, interview, questionnaire, library-based research and internet surfing for the information needed to develop the system.

The analysis shows that the respondents’ observation from Cauayan City Department of Agriculture, that the respondents are strongly in agreement on performance and economics.

The project was evaluated by registered staff who found out that the system would benefit their efficiency by identifying the exact soil moisture content, sending and storing data, automatic sprinkler irrigation, the right moment to irrigate to prevent drowning of the plant, reducing the workload and conserving water.

***Keywords:***

Agriculture, Irrigation, soil moisture, GSM module, microcontroller

# Enhancing SARIAS through Interactive Voice Response System and Customer Relationship Management using Asterisk Application

**Ma. Valen D. Alzate** , Isabela State University - Roxas Campus

***Abstract:--***

The advancement of information technology helps improve customer services worldwide, it is also a tool in improving existing systems to facilitate CRM information retrieval faster and smarter. The enhancement of Student Automated Registration, Information, and Accounting System (SARIAS) through Interactive Voice Response System (IVRS) and Customer Relationship Management (CRM) using Asterisk application enables the ease of handling documents by reducing paper works, time consumption that improves access to students to get information based from their query about their grades from the database of SARIAS anywhere at any time through their mobile phones. Among its benefits, IVR relieves administrative staff and faculty of routine customer interactions and helps the university increase their efficiency, productivity, and profitability. It also routes call to concerned offices and make inquiry to the personnel of the office, and finally it allows the caller to evaluate the services before exiting to the IVRS. System evaluation with the used of questionnaires based on the extent of compliance of the developed system in terms of Agile and DevOps methodology, and ISO 25010 software quality standard were used. The overall assessment by IT experts and end-users revealed that the enhanced SARIAS along with quality of services, accuracy of records, reports, and timeliness had a positive result and an effective instrument in the delivery of front-line services of Isabela State University.

***Keywords:***

Agile method, Asterisk Application, CRM, DEvOps methodology, ISO 25010, IVRS, SARIAS.

## Design and Development of an Op-Amp Solar Charge Controller

**Allan Q. Guillermo**, Instructor II, CTECH

***Abstract:--***

The design, development, construction, and evaluation of an Op-Amp Solar Charge Controller were the focus of the study to contribute in the development of solar power system. The study involved development phase which covered the technical feasibility of the design while the descriptive evaluative phase covered the assessment on technical performance, economic feasibility, environmental soundness, political acceptability, and social acceptability (TEEPS) of the device by experts and users in the community. Based on the design and performance testing, it was found out that the device was functional and a reliable means of charging a battery. Technical performance, economic and financial viability, environmental soundness, political acceptability and social acceptability were all found to be highly viable and valid. Therefore the developed device is feasible for business undertakings by having a 49.15 percent of ROI and a payback period of 1 year and 43 days.

***Keywords:***

Electronics Technology, Efficient Utilization Of Renewable Energy, Solar Power System, Osc Device.

## An Online Facility for the Processing of Research, Extension, & Training Proposals for Romblon State University

**Mary Joy F. Fetalver**, Technological Institute of the Philippines-Manila

**Jennifer B. Enriquez**, Technological Institute of the Philippines-Manila

***Abstract:--***

Document processing is a common approach used by most agencies whether in the public or private sector. Face-to-face interaction by different authorities in every transaction is needed in the processing of documents. The manual processing of Research, Extension and Training (RET) in Romblon State University (RSU) takes a maximum of 2 weeks from the submission of proposals to its corresponding approval due to the in availability/inaccessibility of approving personnel. The study was aimed to provide an online facility where documents and information needed by approving personnel are readily accessible thereby shortening the processing time. It also provides a tracking mechanism that ensures transparency of information and of the processing stages, and accountability of approving personnel. Using the ISO 25010 as metric of evaluation it rendered a highly acceptable rating because the processing of RET proposals takes only a maximum of two days which fared much higher than the manual method.



# Inventory Management Practices of Selected Manufacturing Companies in the Freeport Area of Bataan (Fab)

**Engr. Ofelia G. Micalat**, Asst. Professor III, Polytechnic University of the Philippines Bataan branch

## ***Abstract:--***

In recent years, a number of manufacturing companies have faced numerous challenges where cases of materials overstocking, which eventually get expired or out dated, under stocking, lack of stock-taking, theft of materials by workers, delays in deliveries of materials, and loss of production time among others. However, universality of inventory management challenges mentioned is widely recognized and researchers continue to seek optimal solutions across the globe. Research to date is diversified across many aspects that are basically directed at offering optimal solutions to such stock control problems, particularly timely delivery of needed materials for seamless delivery of goods, products, and services. While there are numerous studies in inventory management with diverse perspectives or emphasis, comprehensive research that attempt to integrate potential impact-areas of emerging inventory management practices in today's increasingly complex society, is presently scarce. Consequently, a wide variety of inventory management opportunities are opening up to modern organizations but a holistic assessment of the impact of deployable tools appears to be currently lacking, thus with the aim of helping to fill this gap, this study proposes a conceptual framework designed to support the choice of the most adequate and appropriate inventory management model for particular manufacturing companies in the Freeport Area of Bataan which is considered the leading hub of investors not only in Region III but in Asia as well. Several manufacturing industries in the Freeport Area of Bataan are currently faced with the challenges of maintaining socio-economic progress amidst unprecedented plunge in crude oil prices and tightening of global financial conditions that had led to reduce export earnings and revenues. It is therefore imperative for manufacturing companies in the Freeport Area of Bataan to have sound, effective and well-coordinated inventory management systems because the business environment is rapidly changing, highly competitive and drastically affects the performance of the organization. With the application of proper inventory management techniques, the right materials will be available at the right time, with the minimum storage costs and investment. The researcher concentrated only on five (5) selected manufacturing companies solely in the Freeport Area of Bataan. These five (5) selected companies produce various types of products such as a tennis balls, lens, fiberglass and different designs of bags. Other companies were not included in the study due to limited time and financial resources of the researcher. This thesis provides academic knowledge on the strategic role of inventory management adopted by the selected manufacturing companies in the Freeport Area of Bataan. Also, the various inventory management practices of five (5) selected manufacturing companies were assessed, the problems they encountered were identified and how these manufacturing companies complement ongoing campaigns to achieve an effective inventory management system sealing leakages in revenue and wastes in expenditure especially unnecessary inventories were determined. The results of the analysis based on related literature indicate that a proper inventory control system is closely associated with low storage costs, cost-reduction and timely delivery of requisite goods, products, materials and services to customers and stakeholders, thereby enhancing sustained profitability, competitive ability, and enhanced market diversification prospects. It can also be concluded that ineffective inventory management leads to incidences of overproduction, underproduction, excessive stocks, and obsolescence of stocks, production bottlenecks and delays in delivery of raw materials. The findings served as a benchmark for companies which are only starting and may prove practical and relevant to concerned companies.

## Driving Cycle Analysis for Fuel Economy of an Urban Public Utility Jeepney in Metro Manila, Philippines

**Robert Michael B. Corpus**, Polytechnic University of the Philippines

***Abstract:--***

The study aims to analyze the on road and the driving cycle fuel economy on a public utility jeepney (PUJ) using micro-trip method. Experiments were conducted on a PUJ with a 4BA1 engine with the route Dapitan to Baclaran and vice versa. An onboard instrumentation was used in gathering speed profile and fuel consumption of a PUJ. Speed data is processed to perform the methodology in developing drive cycles using micro trip method. Drive cycles developed by micro-trip method are selected by its absolute value difference of probability distribution of normalized frequencies. An average fuel consumption of 7.26 km per liter through 18 round trips was calculated from the experiment. A 1400 second cycle was generated with a 6.33% and 19.16% change in fuel consumption and percentage idle respectively.

## Development and Acceptability of Jackfruit seeds Butter (*Artocarpus heterophyllus* Lam)

**Ruby M. Petisme**, Isabela State University Ilagan Campus

### ***Abstract:--***

Jackfruit is a common fruit widely known and found in the Philippines. Its seeds are just scattered and not used productively matters aside from being planted again for another Jackfruit tree. Fruits are consumed by all sectors of a community irrespective of age and gender but, the seeds are used in some local dishes.

The study focused on the development of butter using jackfruit seeds. This product development research included two major phases; (1) preparation of jackfruit seeds butter using the three methods, namely: boiled, roasted and sundried method, (2) preparation of butter using jackfruit seeds as main ingredient. To further appreciate the jackfruit seeds butter, the researcher investigated the product in terms of appearance/color, taste, aroma and texture by conducting sensory evaluation of the finished products. The evaluators consisted of (25) teenager, (25) adulthood and (25) experts. These include households' members of barangay Naguilian Norte City of Ilagan Isabela, students of Bachelor of Technical Teacher Education major in Food Service Management (FSM), faculty members of College of Education and a Students of Master of Arts in Industrial Education major in Technology and Livelihood Education at Isabela State University-Ilagan Campus. The statistical tools used in the study were arithmetic Mean (M) and One Way Between the Group Analysis of Variance to determine the products acceptability.

Results of study revealed that in boiled and roasted method, the jackfruit seeds butter in terms of appearance/color, taste, aroma were described by the respondents rated as "highly acceptable" while "moderately acceptable" in terms of texture. On the other hand, boiled and sundried and boiled method in terms of, appearance/color, taste, aroma and texture were "moderately acceptable" as described by the evaluators.

On the general acceptability of jackfruit seeds butter among varied age groups, jackfruit seed butter using boiled and roasted method was the best method followed by boiled method and boiled and sundried method though it was rated "moderately acceptable". Significant difference was found in the general acceptability of jackfruit seeds butter using jackfruit seeds as main ingredient in terms of appearance, taste, texture and aroma as perceived by the evaluators.

Homemakers, professionals, students or anyone else interested in making butter is encouraged to use jackfruit seed. Food technology teachers, students, homemakers are encouraged to conduct further research studies and innovations in making quality products using local materials considering their nutritional value.

### ***Keywords:***

Jackfruit, butter, Analysis & Development

# Benchmarking of the Water Supply and Wastewater Management System of a Smart City: A Case Study of Cauayan City, Philippines

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**Agnes M. Ramos**, Faculty, CBAPA, Isabela State University, Echague, Isabela, Philippines

**Eva U. Cammayo**, Faculty, CBAPA, Isabela State University, Echague, Isabela, Philippines

## ***Abstract:--***

Undeniably water supply is one of the basic services for demographic, social and economic development of a society. Thereby, the need to have access to reliable and excellent quality water supply regardless of uses is deemed necessary.

The study aim was to benchmark the performance in terms of water supply and wastewater management aspects of the Local Water Utility (LWU) system. The performance evaluation was based on the following domains –(a) sustainability of water supply; (b) water users satisfaction; (c) waste management practices; and (d) compliance of the local government unit in accordance to water security and management.

The assessment framework and indicators used were adapted from the established benchmarking manual by the International Water Association (IWA). The method used in collecting information and/or data for this study involves focused group discussions, key informant interview and conduct of field survey wherein a total of 388 respondents were selected employing stratified random sampling.

Results showed that in terms of water sustainability based on a 40-year projection, in 2040 and 2050, system groundwater withdrawals would exceeds the allowable or safe groundwater yield. Overall acceptability on water quality was slightly poor with a rating of 54% wherein 55%, 56%, 59% and 50% acceptability rating were attributed by taste, odor, color and pressure, respectively. Meanwhile, lack of waste water treatment facilities were observed which resulted to direct disposal of wastes to water bodies. For the last study domain, the local government passed four (4) city ordinances or enabling laws on water and wastewater management for sustainable water resources utilization.

In light of the results of this benchmarking study, more specifically on the issue of sustainability, it is highly suggested that providing or developing alternative water source is necessary as a sustainable approach to adequately and reliably supply water demand for the future generations.

## ***Keywords:***

Benchmarking, Performance, Sustainable, Water Supply, Wastewater

## A Comparison of the Fuel Economy Estimates of a Drive Cycle Developed Using the Road Load Energy Criterion and the Actual On – Road Fuel Economy

**Robert James Lomotan**, Colegio de Muntinlupa

***Abstract:--***

This study presents a comparison of the fuel economy between a drive cycle developed using the road load energy as an assessment parameter and the actual on road fuel consumption of a common rail direct injection (CRDI) passenger van. Second by second velocity as well as fuel consumption were recorded as the test vehicle traverses a 33 - kilometer pre - determined route in Quezon city, Philippines. The data were processed to generate a drive cycle using the modified Markov Chain approach. A user defined compression ratio was used to determine the length of the generated drive cycle. It was then tested on a chassis dynamometer to measure the fuel economy of the drive cycle. The road load energy, fuel economy, average speed, maximum acceleration and percent idle time were used as assessment variables to determine the quality of the drive cycles developed. Three drive cycles using different compression ratios were generated and yielded the following results: A 676 second cycle which has a 2.22% road load energy error and a 4.9% difference in fuel consumption, the 801 second cycle yielded a 3.06% energy error and 2.8% fuel consumption difference and a 901 second cycle with a 1.34% energy error and a 1.2% difference in fuel consumption. The results suggest that the road load energy criterion is a parameter that can be used to generate drive cycles that will give good on – road fuel economy estimation.

## Water Quality Monitoring for Aquaculture

**Christopher R. Che**, Isabela State University- Cauayan Campus, College of Computing and Information Technology

### ***Abstract:--***

Monitoring of water quality is a crucial consideration for management of water quality. The water quality standard is determined by the purpose of using water for drinking, agriculture, business and more, standard is also determined by the water classes. The critical thing is to generate information from observation.

Accordingly, the Water Quality Monitoring with Notification System using Arduino for Aquaculture seeks to assess the water situation based on the PH and turbidity concentrations, there is a need to assess, evaluate distinct water quality parameters. Sensors are used to identify the quality of the water and to transmit it to the database via local network and to notify it via SMS.

The "Water Quality Monitoring for Aquaculture " is an excellent help for fish farmers. The water quality standard will assist fish farmers determine the water situation in the fish pond with real time monitoring, the temperature can also assist fish farmers decrease fish mortality owing to our country's unknown weather.

This part discusses different phases of the spiral model. The researchers use the spiral model as a guide in establishing a Water Quality Monitoring System for Aquaculture. And descriptive methods of research to describe of Water Quality Monitoring for Aquaculture in terms of its software and hardware implementation

### ***Keywords***

Aquaculture, Turbidity, PH, Microcontroller

# Development and Evaluation of Ac/Dc Basic Electronics and Electrical Circuit Connection Trainer

**Jeffrey s. Santos**, Isabela State University- City of Ilagan Campus

***Abstract:--***

The study was focused on the development and evaluation of the AC/DC Basic Electronics and Electrical Circuit Connection Trainer for the students of Isabela State university-City of Ilagan Campus, City of Ilagan, Isabela. This project development research tried to achieve the following objectives: a) Design and construct AC/DC Basic Electronics and Electrical Circuit Connection Trainer; b) Test the functionality of the trainer by conducting various experiments concerning practical basic electronic and electrical circuits through the application of series, parallel and complex connections; c) Determine the acceptability of the prototype in terms of its functionality, workability, durability, safety and instructional applicability as evaluated by the respondents; and d) Make an activity manual that can be used from a developed trainer.

The five-point Likert's scale was used to determine the descriptive meaning of the indicators of the variables used. Furthermore, the Weighted Average Mean (WAM) was used to interpret the equivalent meaning of the data gathered. The Analysis of Variance (ANOVA) was employed to determine the significant difference between the evaluations of the respondents.

The completed project was evaluated by selected six (6) technology instructors, forty-one (41) students, one (1) Electrician and two (2) IT technicians from Isabela State University-City of Ilagan Campus from the Colleges of Engineering, Industrial Technology, College of Education, four (4) shop teachers from nearby technical schools and two (2) technicians from electronics repair center in the locality.

Evaluation result shows that the project obtained an overall mean of 4.78 which means that the trainer is "HIGHLY ACCEPTABLE" to the evaluators based on the criteria of functionality, aesthetics, workability, durability, economy, safety and instructional applicability.

***Keywords:***

development, electronics,Electrical circuit connection trainer,evaluation

## Domotics: A Voice Recognition of home appliances through android phone with linear search algorithm

**May Princeford L. Reyno**, Isabela State University

***Abstract:--***

Development of Domotics: A voice recognition of home appliances is a machine and android application that can help the disabled and elderly persons to become their work easier. The algorithm used in designing this application is Linear Search Algorithm, this algorithm is a sequential search algorithm for finding a specific value in a list that checks each element in order until the desired element is found.

The aim of the research was to produce "Domotics: A Voice Recognition of home appliances via android phone with a linear search algorithm," which could benefit the elderly and the disabled. In particular, the aim was to evaluate the machine's characteristics in terms of the following, user-friendly and safe scheme, performance, usability, time and accuracy. The method used was research and development with the use of Waterfall Model as the Software Engineering Development Model. For the testing and implementation stage, a technical feasibility study was used to identify hardware and software requirements. Questionnaire as system assessment. And system flow diagram for system flow.

The information were collected by questionnaire. Barangay San Juan, Alicia, Isabela had twenty-five (25) handicapped and elderly people. The Likert Scale 5, 4, 3, 2, 1 with the descriptive interpretation of Strongly Agree, Agree, Moderately Agree, Disagree and Strongly Disagree to Evaluate the Effectiveness of "Domotics: A Voice Recognition of Home Appliances.

Hence, Domotics: A Voice Recognition of home appliances with linear search algorithm through android phone should be introduced in home automation for a convenient manner.

***Keyword:***

Voice Recognition, Elderly PWD, Home Appliances



# Assessing the Marketability of Tourism Mobile Application to Young Urban Professionals as Travellers

**Katherine Y. Cadalo**, World Citi Colleges Quezon City

**Cheryll N. Palacio**, World Citi Colleges Quezon City

**John Red G. Querijero**, World Citi Colleges Quezon City

## ***Abstract:--***

This quantitative research assessed the marketability of tourism mobile application (TMA) to young urban professionals (yuppies) as travellers. The study focused on the tourism marketing aspects offered by leading TMAs to users: promotion, transportation, and accommodation. The main sources of data came primarily from 200 yuppies in Metro Manila. This research utilized ANOVA as its statistical treatment.

Findings showed that the respondents' TMA usage has a great contribution for their patronage. The study concludes that among the online services, transportation has a big percentage at giving an impact to these yuppies' patronage. The highest weighted mean for transportation is 4.34 which indicates that the patrons' experience in using TMA gives them a very good service among others. The result of the analysis of variance revealed that there is no significant difference among the usage of yuppies to TMAs ( $p = .700$ ).

This study thereby recommends travel companies i.e. TMAs to send updates and notification about their promotion through popular social networking sites. It must be convenient for travellers when inquiring or frequently asking questions about TMA services without any long processes. This proves that convenience through fast online transactions is the top consideration by app users whenever they plan to travel.

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# Photovoltaic (PV) power prediction based on artificial Neural network with activation function selection And feature reduction method

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## ***Abstract:--***

This paper presents an extensive review of an ANN Based PV Power Output Prediction Model and the exploration of the effect of the common meteorological variables that is used in some research work. This study will discuss the result of the two simulated Models, wherein Model A uses all the parameter as the input variables and Model B applied the feature reduction method that explores all the possible reduced parameter combinations.

A data set consisting of 755 variables (PV power output model) were used to trained and test a 2- layer (1 hidden layer) feedforward neural network model. The study simulated two models A and B. The model A used the conventional method of modelling, training and testing using the six input variables (solar irradiance, maximum temperature, minimum temperature, rainfall, wind speed, and relative humidity). After thorough simulation, the final neural network for model A with six input variables, with 8 hidden neurons, using tan sigmoid activation function, 1 layer and 1 output node. The coefficient value of the PV power model was  $R(\text{All}) = 0.89264$ ,  $R(\text{Test}) = 0.89071$ ,  $R(\text{Training}) = 0.88527$ ,  $R(\text{Validation}) = 0.92738$ ,  $\text{MSE} = 0.025118$ . For the final Model B, the best parameter combination is consisting of four input variables; solar irradiance, Maximum and Minimum Temperature and Relative Humidity with 10 hidden neurons, using tan sigmoid activation function, 1 layer and 1 output node. For model B, the results are  $R(\text{All}) = 0.9034$ ,  $R(\text{Test}) = 0.87312$ ,  $R(\text{Training}) = 0.8969$ ,  $R(\text{Validation}) = 0.95613$ ,  $\text{MSE} = 0.024645$ . Based on testing and validation of Model A and Model B, the MAPE are 44.06% and 19.88% respectively.

The generated weights and biases from the Artificial Neural Network Models were used to derive the equations for predicting Solar PV power output. This study contributes to the Solar PV system design and energy management by considering the meteorological factors on PV power generation and developing an artificial neural network model to predict power output of the solar PV System using back propagation algorithm.

This shows that the Model B using less parameters such as solar irradiance, maximum and minimum temperature and relative humidity provides good forecasting results predicting solar pv power output, as justified by the mean absolute percentage error obtained from the validation and testing of data.

# AgriApp: A Mobile-based Information System for Pest and Diseases of Crops

**Cherry R. Gumiran**, Assistant Professor I, Isabela State University Cauayan Campus

***Abstract:--***

Region 2 is known as the second biggest supplier of crops in the country particularly palay and corn. As a matter of fact, Nueva Ecija and Isabela had increased the production of those crops in the last five year. On the other hand, challenges of farmers were also increasing yearly which pertaining to pests and diseases because of less knowledge in managing and fighting the risk of farming. Agriculturist uses technology as an effective source for communication and disseminating of information. Thus, the researcher developed a mobile application disseminating the correct and reliable information preventing damages made by pest and diseases. Also, displays strategies and techniques helping them increase their production.

The following software was utilized in developing the AgriApp application using the agile model such as ionic, android studio and nodejs. The information was adopted from the Rice Knowledge Bank known as being the expert in rice production and managing pest. The software developed was tested by the agriculture students, IT experts and farmers, also implemented by 2 farmers comparing the result of production using the test plan of Dilky Firdaus. It is concluded that users found less errors and recommending for implementation which is resulting to positive effect in relation to the usability and functionality

***Keywords:***

Agriculture, Crops, Information System, Mobile Application

# An Online Voting Site For Student Council and Government Elections

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## ***Abstract:--***

Technology has always been a big help in reducing workloads in many aspects of the society. With information technology, it provides fast and accurate storage and retrieval of information. The researchers focused on the problem scope within the region of San Jose del Monte in the province of Bulacan. Manual operations gave way to data inconsistencies that may have drastic impact on data analytics and forecasting which the administration needs. Thus, a web-based water billing system provides flexibility and reachability in use and access across different platforms of various desktop and mobile devices. The usability and effectiveness were evaluated along with the related literature and studies done in other institutions, tackling functionality, and portability. The researchers also considered studies concerning enterprise systems since this research tends to deal with enterprise issues. With the said resources the researchers have realized the benefits of a paperless billing system which greatly reduces operational costs. Considering the possible expansion of the system in the future, the researchers used agile model in developing the software, as the deployment is executed per iteration. During the operation and data collection process, 80% received their bills on time. The respondents have neutral opinion on the overall operation which means that there needs a more significant improvement on the software to make a visible impact on performance. With this, the researchers recommend a better output on the process of billing, with a Short Messaging System (SMS) notification to extend more user engagement in the future.

## ***Keywords :***

voting, online, online voting, web, web technologies

# Android-Controlled, Peltier-Based Thermoelectric Charging Station with Arduino

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## ***Abstract:--***

World's dependence on renewable energy continues to rise. Today, people commonly use the hydroelectric and geothermal forms of electricity generation which is good for industrial purposes. In this modern age there still exists communities with less power. Thus the researchers checked the feasibility of developing a simple and practical electricity-generating device using Peltier modules. Consulting the related literature and studies in electricity generation, they found the utilization of a thermoelectric device for generating electricity. This was accomplished through following the principle of waterfall model in the development of the device. The overall design is to produce power and enable monitoring and control using the Bluetooth device. From the data gathered—execution of the developed hardware and survey data the researchers have observed that it is possible to achieve with a practical potential. In light of these they recommend developing a thinner device with more elaborate circuitry in controlling stabilizing the electricity produced by the device—producing a more effective everyday charging device.

## ***Keywords:***

Arduino, Bluetooth, peltier, peltier-based module, electricity generation, charging, mobile devices, heat-based

# Development of Boardinghouse Location Mapping and Information Mobile Application

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## ***Abstract:--***

The apparent increase to the demand of boardinghouses raised the awareness of the community in Cauayan City, Isabela. This study resolves the issue and the development of Boarding House Location Mapping and Information Mobile Application. This mobile App uses Google Maps service and Firebase B-a-a-S with the Ionic Framework to help students to find boardinghouses in the easy way. The objectives of the researcher include the evaluation of both manual and automated process.

The Research Methodology used by the researchers is the Rapid Application Development Method wherein it is suitable for such short span of time and for its flexible development scheduling. It just cycles building, demonstrating, and refining until it passes through testing and implementation. The mobile application undergoes to alpha and beta testing, from implementation to the Google Playstore upload. The researcher also partook Likert scale surveying using pre-evaluation of the manual process and post evaluation of the application using the ISO 9126 standard for Software Engineering. The data gathering tool used by the researcher is the weighted mean for the data interpretation.

The interpreted data concluded that the mobile app passed the ISO standards while the manual process failed, the mobile app is perceived useful to its users and the research objectives were achieved. The developed mobile app will be of great help to the students in the city who are far from home in searching for accredited boarding houses in the city. Some recommendations include improvements in security, distinction in marker indicator design and increase to provincial coverage.

## ***Index Terms—***

Boardinghouse, Location, Mapping, Information and Mobile Application

## A Proposed First Aid and Disaster Preparedness Interactive Reference System (FADPIRS) for Red Cross

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### ***Abstract:--***

This study is an interactive information system that will help the user gain more knowledge about first aid and disaster preparedness. This study aims to develop a web-based reference and computer-based learning software that will provide a helpful tool or referential medium for users that are in need emergency response guidelines. Method of research strategy included a descriptive research approach. The research design refers to overall strategy that you choose to integrate the different components of the study. A system conceptual framework for the study served as an analytical tool in data analysis. The study shows that there is a significant different between the status of the existing system of Red Cross to the effectiveness of the proposed system for Red Cross. The study shows that there is no significant relationship between the profile of the respondent to the status of the existing system of Red Cross. This also shows the proposed solution to address the respondents about the problem of the existing system of Red Cross. The study used a survey method that the researcher creates a type of questionnaire that will answer by the respondents to help researcher find the result of the research study. The proposed first aid and disaster preparedness interactive reference system will help the user to understand more on how to treat and perform first aid and disaster preparedness.

### ***Keywords:***

Disaster Preparedness, Interactive Reference System, interactive learning

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## Front Desk Information System for Saint Felicity College

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### *Abstract:--*

The researchers will make a front office/reception system as a hands-on part of Front Office Services NC II for the students of the Saint Felicity College. Front Office is the first place where guests or customers arrive and come in touch with the staff. Front office is the mirror of a hotel. The function of the front office is to directly get in touch with customer. Such room can discover more information about the customer and provide information for the customers. After all, Front office includes roles that affect the right side (revenues) of trading statement of the business.

The function of the system is about making reservation. This may also serve as an exam for the students of Saint Felicity College. Knowledge of students of HRM can be tested in this system. Our objective to this system is to develop Front Office System that will schedule all the reservations of the students in an easy way.

Front Office System that will allow the students to know rooms available and types and costs room that the customer's wanted at a certain time. Front Office System that provides receipt and proof of billing statement for the customer. The methodology Owe

use in this is system in prognostic type of research and creative type of research. Then the different Data Gathering instrument which consist of observation, research survey and interview, in addition, the different analysis, system design, and System implementation. The result will show what is the system needs and what should the developers do to improve it.

On receiving system design documents, the work was divided into modules/units. The actual coding was started, as well. The system was first developed in small programs called units, which were integrated in the next phase. Each unit was developed and tested for its functionality; this was referred to as the unit testing. Unit testing mainly verifies if the modules/units meet specifications. The researchers were not able meet yet this phase as the system has undergone in constructing the different functionalities for the client.

### *Keywords*

Front Office System, Hierarchy input process (HIPO), Waterfall Model, TESDA, ISO 9126, Front Office NCII



# iReportMo: Design and Implementation of a Web and Mobile Application to Monitoring Crime Report

**Jonh Ray B. Medina**, Angeles University Foundation

***Abstract:--***

Crime is one of the main issues of any citizen nowadays in any country. Many visitors as well as civilians are not comfortable in the society that have lots of crime reports. This paper will focus on the development of an application that will avoid some of the main crime issues in our society. The application will then help the policeman and civilians to report the crime as well as avoiding such crime on their places. It will focus in the reporting crime from the civilians and analyzing it by the help of the policeman using the web or mobile application. Agile Methodology have been used to develop the iReportMo application. The application has been tested to prove the feasibility of the system to the society and it was been concluded that using this web or mobile application it is very easy for them to report and analyze the crime.

# Design and Development of a Solar-Powered Smart Irrigation System Prototype: An Adaptive Process Model

**Rose Mary A. Velasco**, Isabela State University

***Abstract:--***

This paper presents the technical design of a smart irrigation system using Internet of Things (IoT). Its output is a prototype with a combined technology in irrigation and monitoring a vegetable farm. In the design process, an adaptive process from traditional irrigation was utilized to illustrate and verify design aspects of the system. A block diagram was designed detailing the circuit architecture of its electronic components including IoT devices. The utility model was mounted with Arduino microcontroller, GSM and Wi-fi modules, relays, transistors, capacitors and other circuit. A photovoltaic energy was utilized to drive the circuit board to complete its electrical function. The connected IoT devices coupled with cloud computing programs and several software development software like Hypertext Preprocessor (PHP), MySQL database and Arduino Integrated Development Environment (IDE) completed the design process.

Technical aspects were evaluated by Information Technology Experts and was validated using quality standards on IoT Application Quality Management (IoT-AQM). Solar-powered smart irrigation system is one of the answers of traditional irrigation system in the Philippines. It is one of the solutions to a water shortage in vegetable farming where outcomes tell us that this result can be executed for a lessening of water loss and decrease the manpower necessary for farming. It is recommended for small projects of every barangay so that vegetable farmers can gradually adapt the modernize methods of irrigation system in farming.

***Keywords:***

Cloud Computing, IoT devices, Smart Irrigation, utility model, prototype, sensors

# Development and Implementation of Household Flood Hazard Mapping Information System

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**Betchie E. Aguinaldo**, Isabela State University, College of Computing Information Communication Technology

## ***Abstract:--***

One of the most environmental challenges that we encounter in the Philippines is Flooding. Most of the cities within the country experiences flooding especially when it rains. There had been projects, studies and researches conducted to map and analyse the risks of flooding in the country, but it is generally conducted and has only few specific cities (Municipality) involved in the said projects, studies and researches. The work presented here is a Household Flood Hazard Mapping Information System based on the assessment on problems encountered with the available Flood Hazard Mapping technologies in terms of their availability, usability, accessibility, report generation and user expertise. A questionnaire was also carried out to sample and determine the city (municipality) household profile. A City (Municipal) Household flood hazard map was produced based on the defined and assessed available Flood Hazard Map of the city (Municipality). The work has provided and identified the problems encountered with the available technologies in terms of availability, usability, accessibility, report generation and user expertise. It also provided a municipal flood hazard map where, it is find out that there were 34% of the barangay of the city (municipality) was categorized into high level flood risk (some part). It also provided a barangay flood susceptibility map of one barangay in the municipality and it was identified that none of the households were categorized into high level risk of flooding, 16% of the total were categorized in medium susceptible areas, 41% of the total were categorized in low susceptible areas and, 43% of the total were categorized in safe zone. This work also has provided a Flood Hazard Mapping Information System that provides a features and functionalities in terms of household location, household profile and household flood susceptibility.

## ***Keywords:***

Household Flood Hazard; Flood; Hazard; Mapping; Questionnaire; Higher Education.

# Development of Mobile Document Tracking System with QR Code Scanner

**Joel M. Gumiran**, Assistant Professor II, Isabela State University Cauayan Campus

## ***Abstract:--***

The need to track the movement of the valuable document is necessary in an organization specially in the Isabela State University Cauayan Campus where documents are physically moving from offices for approval process. Problems occurred due to massive documents that being processed, locating and checking the status of the document is hard. Thus, this research entitled “Mobile Document Tracking System with QRcode Scanner(MoDoTraQ)” provides an easy way to locate or monitor the movement and the status of the document while it is on the process.

The researchers used a spiral model as a guide in the development of the system using the following development platform such as angularJS, MySQL, Visual Studio code, xampp, android SDK, git(Bash), ionic framework v.3.20.0, java development kit (JDK), node.js. The system was tested by sixty-five (65) staff from different offices of Isabela State University Cauayan Campus and five (5) IT Experts from the College of Computing Studies, Information and Communication Technology. Also, a survey questionnaire as their instrument in gathering the data.

From the findings and result gathered, the researcher concluded that majority of the staff found that the developed system very much effective particularly in terms of performance, information produced and security. Hence, the mobile application is considered beneficial to the staff and the result is reliable comparing to the manual process used by the university.

## ***Keywords :***

Document Tracking, Mobile, QR Code, Scanner

## Dynamic Oil Leakage Perceived in H<sub>2</sub>O with Indicator and Navigational System

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***Abstract:--***

The Dynamic Oil Leakage Perceive in H<sub>2</sub>O with Indicator and Navigational System (D.O.L.P.H.I.N.S.) is a continuous monitoring system that uses Electrical Conductivity (EC) sensor and Light Dependent Resistor (LDR) to detect the presence of oil spill on water. It can monitor continuously day and night. Through the use of GSM the device can send SMS containing the information about the oil spill to the Marine Authorities.

***Keywords:***

Electrical Conductivity, Light Dependent Resistor, Oil Spill

## Development of Fabric from Sansevieria Trifasciata (Snake Plant)

**Alelie M. Apalla**, College of Education, Isabela State University, City of Ilagan

***Abstract:--***

The study aimed to investigate the potential of Sansevieria Trifasciata fiber for textile application. By using the Sansevieria Trifasciata fiber, the researcher attempted to produce a fabric that can compete with other native fabrics here in the Philippines. This natural fiber from Sansevieria Trifasciata is hoped to support, promote and encourage the growth and development of other native products in the Philippines particularly in the province of Isabela. To assess the acceptability of Sansevieria Trifasciata fabric, a group of students and teachers/trainers were asked to do the evaluation along these criteria: appearance, durability, usefulness and eco-friendliness. Results of evaluation showed high acceptability of the product.

The product has unique property which makes it capable of withstanding pressure without any fiber degradation. The developed fabric's breaking strength likewise revealed that it has physical potential to be used in manufacturing goods made of fabric. Due to its great strength, cost-effectiveness and renewable source, fabric developed from Sansevieria Trifasciata fiber has potential use in the clothing industry.

***Keywords:***

Extraction, Fabric, Fiber, Retting Method

## Growth and Yield Performance of Rice Varieties under Different Planting Methods

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**Edwin B. Marayag**, Department of Research and Development, ISU Cabagan- Campus

### ***Abstract:--***

The study was conducted for two (2) consecutive croppings specifically during the wet season of 2018 (first cropping) and dry season of 2019 (second cropping) at the Central Experiment Station of the Isabela State University - Cabagan Campus. It aimed to evaluate the performance of different rice varieties under different planting methods. A total area of 3,026 square meters was laid-out in three equal blocks with subplots measuring 10m x 10m. The following treatments were allocated using the randomization procedure for Randomized Complete Block Design (RCBD): Two rice varieties - hybrid variety and inbred variety; and four planting methods such as broadcasting; drum seeding; transplanting of 12 days old seedlings and transplanting of 24 days old seedlings. Result revealed that hybrid variety transplanted at 12 days and broadcasted inbred variety significantly produced the highest yield per hectare and ROI in the first and second cropping.

### ***Keywords:***

Growth and Yield Performance, Rice Varieties, Planting Methods

## Crime Analytics Using Algorithmic Models

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### ***Abstract:--***

In the last five years, crime incidents have been recorded in Cauayan City, Isabela. In order to eradicate crime incidents, there is an essential need to analyze, examine crime occurrences, and emerging crime patterns. This paper identified and examined the prevalent crimes in Cauayan City based on time and locations of commissions and likelihood of crime occurrences within the day using Philippine National Police Blotter Database during 2015 to 2019 consisting of 4,544 instances of crimes. Different attributes from the dataset were considered in order to create framework, frequency matrix, table of comparisons and figures. Some attributes were also identified as to the prevalence of crime to when and where they occur. Also, the dataset is analyzed by four classification algorithms namely J48, JRip, PART and RandomForest and compared their performances for predictive analysis. Results and findings of the study provided substantial information to the policing capability, enhancement and development of crime monitoring. Lastly, the result can be accommodated and use by police department, various agencies and other organizations which helps them foresee prediction rate of incidents and develop techniques, preventive measures and plans to target crime reduction.

### ***Keywords:***

Data Analytics, Crime Analysis, Predictive Analytics Algorithm



## Development and Sensorial Evaluation of Macaroons with Shoots from Different Species of Bamboo

**Catherine M. Aggabao**, Isabela State University, City of Ilagan Campus

**Abstract:--**

The study focused on the development and acceptability of macaroons made from different varieties of bamboo shoots with four flavorings. This product development research includes two major areas: preparation of bamboo shoots, and preparation of twelve types macaroons using the bamboo shoots in four different flavors. To further appreciate the developed macaroons, the researcher investigated the acceptability of the products in terms of appearance, aroma, taste, and texture, and in terms of the sensorial evaluation of bamboo shoot macaroons flavored with corn syrup, corn kernel, honey and latik along with the following age groups: children, teenagers, adults and experts. The evaluators were randomly chosen. The statistical tools utilized in this study were mean, standard deviation, and One-way Between Groups Analysis of Variance (ANOVA) with Pos Hoc Analysis Using Tukey HSD when a significant difference was revealed based on the result of ANOVA. A five-point Likert scale was used in the determination of the evaluators' rating.

Results of this study revealed that all twelve developed macaroons from Bayog, Kawayan Killing, and KawayanTinik bamboo shoots each flavored with Corn Syrup, Corn Kernel, Honey and Latik were "highly acceptable".

All different varieties of macaroons were highly acceptable in general in terms of appearance, aroma, taste, and texture.

The different varieties of macaroons were also "highly acceptable" in general according to the evaluators' age group with the highest total mean for macaroons from KawayanTinik flavored with Latik while the lowest for macaroons from Bayog with Honey.

Meanwhile, significant difference was found in the general acceptability of the macaroons as perceived by the evaluators when grouped according to their age group. The significant differences exist between children and experts for macaroons from Bayog with Corn Syrup, Bayog with Corn Kernel, Bayog with Honey, Kawayan Killing with Corn Syrup, Kawayan Killing with Latik, and KawayanTinik with Corn Syrup, while between the children, teenagers, and experts for macaroons made from KawayanTinik flavored with Honey.

The nutritive content of the developed bamboo shoot macaroons has a greater amount of carbohydrates, a good source of energy giving food. It is also heart friendly and it helps to control bad cholesterol throughout the body because the developed bamboo shoot macaroons are low in fat content and contain considerable amount of protein the body needs.

Finally, the shelf-life of bamboo shoot macaroons when stored in normal temperature can last for six days and when stored in cold temperature, the bamboo shoot macaroons can last for ten days.

**Keyword:**

Development, Sensorial Evaluation, Experimental Cookery, Bamboo Shoots, Macaroon

# An Empirical Comparison of Multiple Linear Regression and Artificial Neural Network for Load Slab-Deflection Prediction Modeling

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**Maria Leana D. Campos**, Pamantasan ng Lungsod ng Valenzuela

**Andrei D. Dela Cruz**, Pamantasan ng Lungsod ng Valenzuela

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**Jordan N. Velasco**, Pamantasan ng Lungsod ng Valenzuela.

## ***Abstract:--***

All structures are subjected to different kinds of environment and conditions that result to deflection. Reinforced concrete (RC) slabs may exhibit deflections due to different types of loadings in the form of cracks; excessive deflections pose problems in structural stability and may reduce overall integrity of the whole structure. In this research, a load-deflection behavior prediction of RC slabs with the use of artificial neural network (ANN) and multiple linear regression (MLR) is designed. RC slab properties are used, such as thickness, effective depth, span length; concrete compressive strength, concrete tensile strength, concrete Young's modulus; steel yield strength, steel Young's modulus; ultimate load and maximum deflection, as input variables for the models, which will then be simulated using MLR analysis and ANN (dubbed as models "A" and "B", respectively). Results showed that model "A" have coefficient of correlation (R) equal to 0.896 and mean square error (MSE) of 68.137 while model "B" obtained an R and MSE of 0.998 and 1.259, respectively. Calculating mean absolute percentage error (MAPE) for models "A" and "B" yielded 24.105% and 4.241%, respectively, which means that the ANN model yielded closer predicted values as compared to the measured deflection values. It can be concluded that the predictions made with ANN displayed better results than MLR analysis and thus considered as a more efficient way for this prediction approach.

## ***Key words:***

Artificial neural network, deflection, reinforced concrete slab, multiple linear regression

# Productivity of Hybrid Rice (Mestizo 27) Under Different Water and Nutrient Management System

**Jayson C. Atal**, Faculty, Provincial Technical Institute of Agriculture Isabela State University-Cabagan, Isabela

## ***Abstract:--***

A field experiment was conducted to determine the productivity of hybrid rice production under different water and nutrient management strategies at Isabela State University, Cabagan, Isabela from March 23-June 05, 2018. Experiment was laid out in a split plot design with four replications with water management schemes as main plot treatment consisted of Alternate Wetting and Drying -15 cm ( $A_1$ ), Alternate Wetting and Drying -20 cm ( $A_2$ ), Field Capacity ( $A_3$ ) and Continuous Flooding ( $A_4$ ) and nutrient management strategies as subplot consisted of Recommended Rate ( $B_1$ ), Leaf Color Chart ( $B_2$ ), Critical Growth Periods ( $B_3$ ) and Rice Crop Manager ( $B_4$ ).

Results showed that there was a comparable effect on plant height, root length, unproductive tillers, panicle length and weight of 100 grains of the different water and nutrient management strategies. The application of nutrient management thru Leaf Color Chart ( $B_2$ ) gained highest in the number of productive tillers, number of filled grains, biomass weight, crop cut yield and yield per hectare. Similarly, the interaction effect of water management thru field capacity and nutrient management thru leaf color chart ( $A_3 \times B_2$ ) resulted in numerous productive tillers and highest yield per hectare. Highest number of unfilled grains was significantly highest in nutrient management thru Recommended Rate ( $B_1$ ), Critical Growth Period ( $B_3$ ) and Rice Crop Manger ( $B_4$ ).

Moreover, water management thru Field capacity ( $A_3$ ), continuous flooding ( $A_4$ ) and AWD-15 ( $A_1$ ) in combination with leaf color chart ( $B_2$ ) produced highest yield among treatments. The interaction effect of Field Capacity and Leaf color Chart ( $A_3 \times B_2$ ) gained the highest net income and return on investment. Timely application of nutrients thru leaf color chart recommendation gained positive result in all yield parameters at the same time avoided excessive spikelet sterility or unfilled grains. The combination of all water management schemes with leaf color chart was seen to be effective in maintaining and increasing the yield of hybrid rice variety even beyond safe AWD-15.

## Students' Attitude and Performance towards Solving Problems in Mathematics

**Alberto R. Sia, Jr**, Isabela State University – Philippines

***Abstract:--***

The worldwide effect of climate change makes an environmental impact on the human race. Devastating storms that cause heavy flooding to different countries become imminent and recorded a billion casualties around the globe. This problem captured international attention in the formulation of policies on the preparation, mitigation, responses on and recovery from disasters during calamities. This study focused on the development of a Municipal Disaster Risk Reduction Management Flood Control Decision Support Monitoring and Alarm System. Descriptive and developmental research designs applying the SDLC prototyping model, VB.net and Arduino programming were utilized. Identification of problems and challenges encountered by MDRRMC on flood monitoring and assessment on the extent of compliance to ISO 20510:2011 Software Quality Standards were evaluated by 10 IT experts using survey questionnaires, 11 Users and 187 resident/subscribers thru 5 point Likert Scale. The research revealed that the participants' general assessment of the system's compliance to ISO 20510 Standards as Very Great Extent with respect to the usefulness, functionality and completeness of the system in support to the MDRRMC operations. The system performs real-time detection of water levels of creeks/rivers which provide sound alarm to the nearest affected residents and text message alerts to residents/subscribers. Moreover, the system also allows sending of additional alert messages to the subscribers prior to the expected typhoon landfall.

***Keywords :***

Arduino, MDRRMC, End Users, ISO 25010, IT experts, Prototyping-model, Water Sensors.

## Students' Attitude and Performance towards Solving Problems in Mathematics

**Alberto R. Sia, Jr.**, Isabela State University – Philippines

***Abstract:--***

The study focused on how to find out if there is a significant relationship between the students' attitude and performance in solving word problems in Mathematics.

A random sample of 175 students were drawn using from the total population of 505 students at the College of Development Communication, Arts and Sciences, who were enrolled during the first semester of the school year 2018 – 2019. The stratified random sampling method with proportional allocation was used after determining the sample size through the Slovincs formula.

A ten-word problem test on number, age, coin, work and investment and an attitude inventory were used to gather students' performance and attitude towards word problems, respectively.

Results of the study led to the findings that the students had low performance in solving word problems and that their lowest performance was in solving investment problems. However, they performed considerably better in solving number, age and coin problems. Majority of the students have fair attitude towards solving word problems; some have favorable attitude, very few have very favorable attitude, and very few also have unfavorable attitude towards solving algebraic word problems. The T-test pointed out that there is a highly significant positive relationship between the students' attitude and performance in solving word problems, that is, students who have favorable attitude towards word problem solving have the tendency to perform better than those who have less favorable attitude.

***Keywords:***

Performance, Word Problem Test, Students

# The Water of the Living: An Assessment of the Microbiological Elements Found in Holy Water Fonts Across Quezon City

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***Abstract:--***

Majority of Filipinos are Catholic devotees. Thus, it is part of Catholic custom that a devotee, upon entering the holy place, should dip their forefingers in the holy water font posted within the entrance of the sanctum and make the sign of the cross. However, this customary practice has its implications in public health.

Recently, a landmark study by Kirschner et al. (2012) reported contaminations of holy water fonts and holy springs in Vienna, Austria, with cell counts of up to 107 colony forming units (CFU) ml<sup>-1</sup>, and the presence of fecal indicator bacteria such as enterococci and *E. coli*.

The researcher aims to provide an assessment of the conditions of holy water fonts by testing Catholic Churches within Quezon City for the presence of microorganisms with the aim to provide public health awareness to church goers as well as make recommendations on how to limit infections from a potential microbiologic reservoir.

# Autonomous Robotic Equipment: An Irrigation Control System

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***Abstract:--***

Agriculture is the asset for any country's economy with a strong connection between agriculture growth and economic prosperity. In this generation, Smart Agriculture is not just a technology that eases human life but also a necessity to cope with the fast increase in food demand. This study presents the advanced solution for monitoring and controlling the weather conditions in greenhouse and make the information visible anywhere in the world. It deals with the environmental conditions like temperature, relative humidity, soil moisture, light and plant growth with sensors that will sends information to the web page. The Internet of Things (IoT) was integrated in the irrigation control system to collect and store data from the monitored information from sensors. Lastly, testing were conducted in a controlled environment to test the effectivity of the irrigation control system. Three trials were conducted at the common greenhouse of the Department of Agriculture stationed in Cauayan City, Isabela. Findings resulted that the Autonomous Robotic Equipment consistently release water faster than compared to water sprinkler with human intervention. This shows that propose technology solution will play a major role in agriculture.

***Keywords:***

Greenhouse Technology; Robotic Equipment; Internet of Things

# Hydrologic Responses to Climate and Land Use Changes of Magat Watershed, Isabela Philippines

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**Jeffrey Lloyd Bareng**, Director, Water Research and Development Center, Isabela State University, Echague, Isabela, Philippines

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## ***Abstract:--***

Hydrological modeling of watersheds is a valuable tool for watershed management and assessment for extreme events. To utilize water resources in a sustainable manner, it is necessary to understand the quantity and quality in space and time. This study was initiated to evaluate the performance and applicability of the physically-based Soil and Water Assessment Tool (SWAT) model in analyzing the model hydrologic response as impacted by climate and landuse changes on the streamflow variability and estimation of monthly and seasonal water yield at the outlet of Magat watershed. The SWAT model performed satisfactorily well in simulating monthly streamflow with a coefficient of determination ( $R^2$ ) of 0.6101 and 0.6111; Nash–Sutcliffe Efficiency (NSE) of 0.7980 and 0.8279 during calibration and validation, respectively.

Simulation results showed that the model was unable to effectively capture peak flows with lag time for some events. Besides these, SWAT model was able to perform well on scenario analysis of climate change impacts on streamflow using the 2050 baseline projections wherein a significant decreased during summer months (March–May) while an increased during the rainy months (August–December) by 36% and 8%, respectively. Meanwhile, results of scenario runs on landuse changes revealed that streamflow increases by 3.22% as an effect of increased in rainfall; conversion of agricultural and grass lands through urbanization yielded an increased in overland flow and erosion of 3.60% which eventually reduces baseflow within the watershed; scenario on reforestation initiatives leads to a desirable impact which reduces erosion and improved baseflow by 3.62% and 3.22%, respectively.

The result suggests that SWAT model can be taken as a potential tool for simulation of the hydrology of ungauged watershed in mountainous areas, which behave hydro-meteorologically similar with Magat watershed.

## ***Keywords:***

climate change, hydrologic response, landuse change, SWAT model, Magat watershed



# System Improvement of Biogas Digester using SMS Notification and Methane Production and Monitoring

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## ***Abstract:--***

Anaerobic digestion processes organic matters by decomposition/breaking down into particles from biodegradable wastes using containers to form biogas and organic fertilizers. Biogas technology takes the form of biogas digesters are producing methane which is a flammable gas and organic fertilizer as its by-products. Biogas digester parameters that needs proper monitoring to ensure smooth operation and prevent system failure. That include methane yield, loading rate, temperature, retention time and acidity using SMS notification and Monitoring.

## ***Index Terms-***

Biogas technology, biogas digesters, methane, Liquefied Petroleum Gas, Organic Fertilizer

# The Impact of Scientific Knowledge Questions Using Google Forms in Conducting Review Sessions in Biology

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## ***Abstract:--***

This study aimed to know the effectiveness of scientific knowledge questions using Google form in conducting review sessions in Biology. It sought to answer the problems with regard to the performance of the students in the pretest and posttest in the four competencies namely: description of how the nervous system coordinates and regulates these feedback mechanisms to maintain homeostasis; explanation of how protein is made using information from DNA; explanation of how mutations may cause changes in the structure and function of a protein and explanation of how fossil records, comparative anatomy and genetic information provide evidence for evolution.

The study utilized the Pretest and Posttest Design and underwent pilot testing and expert validation of master teachers and a Science Coordinator. The control and experimental groups were identified using fish bowl technique. Thirty five (35) students were used in both experimental and control groups. Pretest was given to both groups. Respondents from the experimental group were asked to answer scientific knowledge questions using Google form during review sessions for five (5) weeks. On the other hand, the respondents from the control group were given conventional way of conducting a review. After five (5) weeks, posttest was given to both groups. The pretest and posttest results were gathered and analysed through appropriate statistical treatment using SPSS Volume 21. The respondents in the experimental group were also interviewed to get their perceptions in answering scientific knowledge questions.

Based on the data gathered, there is an improvement on the performance of the students in the experimental group who answered scientific knowledge questions using Google form during review sessions in Biology with a mean difference of 10.94.

There was a significant difference between the pretest and posttest mean scores of both experimental and control groups.

It can be concluded that better result is achieved since students are more engaged because videos and pictures are included in Google form. Google form is an effective tool in developing students' skill in answering and analysing higher order thinking skills questions.

## ***Keywords:***

Scientific Knowledge, Google Forms, Review Session, Biology

# The Influence of the English Translation Methods on High School Students Comprehension of Clips and Films

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## ***Abstract:--***

English translation methods (dubbing and subbing) have been utilized by many educators, especially in the Philippines where foreign clips or films are used to teach lectures in class. However, language barriers and different elements could prevent the learning of a student. This mixed method research analyzed the factors of the two translation techniques and observed the “watching” behavior of 34 senior high school students of First City Providential College in Bulacan. The research used tabulation method with the formula of  $P=f/n \times 100$  for the questionnaires; Content Test and English Test of the dubbed and subbed group. Thereafter, the researcher observed the possible factors that affected their understanding which is based on K. Shivaramu’s book. The interpreted data revealed that the two groups did not have a significant difference on their English proficiency, yet the subbed group averaged higher and scored more perfect scores on the Content Test. The observation of the researcher unveiled several factors; interest, focus, and noise to be relevant in their understanding as the dubbed group showed more of the factors than the subbed group. Therefore, subbing is better than dubbing in terms of making its audiences understand the contents of the film and should be applied by educators that plans to use foreign clips and films for teaching.

## ***Keywords:***

English translation methods, dubbing, subbing, foreign clips and films, mixed method research, English proficiency, and observation.

## The Perceived Effects of Online Games to the Student's Academic Performance In General Mathematics

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### ***Abstract:--***

In this generation, technologies and communication are now trending especially with the young. Playing online games is now more common to the student and many studies say that it involves our mental ability because we are using our analytical thinking, decision making, logical and mathematical intelligence, deductive reasoning, and more. The researcher conducted a study to find if there is a correlational relationship between playing online games and general mathematics performances. The researcher wanted to find on how playing online games affect the study of the student and how the students cope with their studies while also playing online games. In this study, researchers used a non-probability sampling method which is the convenience sampling and used questionnaire-checklist for an instrument. The respondents were 40 students, 31 coming from second-year BS Psychology and 9 students from first-year BS Psychology. The findings of this study are students can balance their time playing online games and studying but sometimes they neglect their responsibility because of playing. According to data also, the effect of playing online games is highly effective to their general mathematics performance and it increases their mental capability of solving regarding in number, logic, reasoning, analyzing, and more.

### ***Keywords—***

Mathematics, online games, playing, cognitive, thinking, logical, ability, students

# The Relationship of Study Habits and VARK Preferences to the Academic Performance of Second Year Education Students

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## ***Abstract:--***

Study habits are very essential for students to cultivate. They have to be nurtured and be given more time to attain success in life. However, good study habits should be coupled with appropriate time and place, and these could not be done without the willingness of the students. In today's generation of students, they learn in different ways. They use methods on how they could learn easily by assessing their capabilities, specifically, on what they could do or what they could not do based on their evaluation of their own study habits. This research aims to determine the significant relationship of study habits and learning preferences to the academic performance of second year education students of First City Providential College. It shall use correlative method and random sampling. Moreover, quantitative method shall also be employed in determining the profile of students, their academic performance, learning styles, study habits. Pearson's correlation coefficient shall be used as the statistical treatment to test the significant relationship of the given variables. The data are to be elicited from the responses of the respondents through survey questionnaire. Consequently, the results of the study yield to the creation of programs that will enhance the students' preferred modalities and their study habits to achieve academic success.

## ***Keywords—***

study habits, learning preference, academic performance, education, students

# The Role of Artificial Intelligence in the Improvement of Human Interpersonal Communication

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## ***Abstract:--***

In this age of artificial intelligence, it is not only the job market that is being challenged, but more so the sense of human interactions. Due to this reason, the role of artificial intelligence in improving human interpersonal communication is vital. This study proves that AI, although sometimes deemed as a hindrance to interpersonal relationships, can be a bridge to make it more meaningful. This descriptive research emphasized the relevance of AI in communications and obtained information concerning its current status in the Philippines as well as in the emergence of the global world system. Participants are from 10 different countries—Philippines, Malaysia, Korea, United States, United Kingdom, Canada, Italy, Bulgaria, Syria, Africa. The researchers made use of participant's diverse cultural and occupational background to better grasp how helpful AI services and products in everyday communications. are from— including 1 local AI firm. Analyzed data revealed that there are current AI features and devices which contribute to the continuous exchange of information—from personal to digital and vice versa—as well as ongoing investments for intensive and extensive researches to further improve its characteristics and develop related technologies. Thus, AI plays a vital role in communications today and even before it was not yet as advanced as now.

## ***Keywords—***

Social Science (discipline of the study), artificial intelligence, interpersonal communication (concept/s being studied), descriptive design (method/process)

# Understanding the E-Purchasing In First City Providential College Cafeteria

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## ***Abstract:--***

A school is a community where transactions for purchasing of goods and services also applies. This is to maintain the quality and value of the product minimize cash tied up in inventory and maintain the flow of input and output procedure. In this era, younger generation take advantage of technology to save time, create new things and thus, providing convenience for everyday life. The recent technologies invented are smart pens, digital textbooks, virtual keyboards, flash drives, laptop and other digital gadgets which made student life easier. First City Providential College implemented the Smart ID, whereby school IDs may be utilized as a replacement for cash transactions. Student IDs work as the mobile credential where contact number, picture and other significant information may be used for purchasing books in the bookstore and food in the cafeteria.

This qualitative research aims to understand the smart IDs effectiveness in providing convenience for the students and school employees in terms of the safety, budgeting and speed of transaction. In gathering the data, the researchers utilized survey sheets for the random sampling of respondents from FCPC. Based on the findings, there was an issue on the effectiveness of e-loading station services due to the insufficiency of terminals. It was also emphasized that Smart ID system is convenient means in the cashless transactions of employees and students. The convenience it brings and the safety features of the Smart ID are part of the advantages in E-Purchasing. Therefore, smart ID is highly effective and manageable in FCPC.

## ***Keywords—***

FCPC, FCPCIANs, E- Purchasing, Smart ID

# Water Resources Planning: An Assessment of Potential Sites Using Gis-Based Model as a Decision Support Framework for Diversion Dam in Isabela Province, Philippines

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## ***Abstract:--***

The study harnesses the potentials of a GIS-based model as a decision support framework to optimize and identify suitable locations of Diversion Dam (DD). Diversion projects entail the drawing of water under controlled conditions directly from the flow of rivers or streams. The development of small scale irrigation facilities (i.e. diversion dam) is one of the modest attempts of the Department of Agriculture (DA) to increase productivity of our agricultural lands. A promising way to achieve this is by providing irrigation in rain-fed areas through small scale irrigation projects (SSIP) such as the establishment of diversion dams.

In this study, a multi-criteria framework was carried out in GIS platform to effectively integrating a number of indicators or factors such as weather, soil type, slope, and landuse or land cover. Also, derived data such as dependable flow, river width, and river profile were considered using the Soil and Water Assessment Tool (SWAT).

Results showed that in the province of Isabela there are 50 identified potential sites for diversion dam with a total of 2,592.40 hectares potential service areas to be catered by this proposed system, the diversion dam. Accordingly, model results were satisfactorily validated and assessed by randomly locating and visiting the existing diversion dams based on the suitability map generated from GIS-SWAT modeling.

In view of the results, it implies that the diversion dam suitability model derived in this study conforms to the criteria of the existing irrigated agricultural land. Therefore, the diversion dam suitability map derived in this study could be used in optimizing irrigated agricultural land and production.

As such, the derived maps could serve as a useful guide to policy makers in terms of water resource allocation and management particular in planning and construction of diversion dams in the province of Isabela.

## ***Keywords—***

Diversion Dam; Gis-Based Model; Potential Sites; Water Resources



# Benchmarking Water Supply and Wastewater Management System of a Smart City: A Case Study of Cauayan City, Philippines

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## ***Abstract:--***

Undeniably water supply is one of the basic services for demographic, social and economic development of a society. Thereby, the need to have access to reliable and excellent quality water supply regardless of uses is deemed necessary.

The study aim was to benchmark the performance in terms of water supply and wastewater management aspects of the Local Water Utility (LWU) system of Cauayan City. The performance evaluation was based on the following domains – (a) sustainability of water supply; (b) water users' satisfaction; (c) waste management practices; and (d) compliance of the local government unit in accordance to water security and management.

The assessment framework and indicators used were adapted from the established benchmarking manual by the International Water Association (IWA). The method used in collecting information and/or data for this study involves focused group discussions, key informant interview and conduct of field survey wherein a total of 388 respondents were selected employing stratified random sampling.

Results showed that in terms of water sustainability based on a 40-year projection, 2040 and 2050 time frames, system groundwater withdrawals would exceeds the allowable or safe groundwater yield. Overall acceptability on water quality was slightly poor with a rating of 54% wherein 55%, 56%, 59% and 50% acceptability rating were attributed by taste, odor, color and pressure, respectively. Meanwhile, lack of waste water treatment facilities were observed which resulted to direct disposal of wastes to water bodies. For the last study domain, the local government passed four (4) city ordinances or enabling laws on water and wastewater management for sustainable water resources utilization.

In light of the results of this benchmarking study, more specifically on the issue of sustainability, it is highly suggested that providing or developing alternative water resource is necessary as a sustainable approach to adequately and reliably supply water demand for the future generations.

## ***Keywords—***

Benchmarking, Performance, Sustainable, Water Supply, Wastewater

# An Improved Word Representation Using Word Embedding for Document Classification

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***Abstract:--***

Document Classification has always been considered as an important Natural Language Processing task because of the number of digital documents that are increasing exponentially each day. Different methods using machine learning or a combination of algorithms as ensemble methods to improve the efficiency of a document classification model were presented in many works of literature. Recent trends suggest that using a word embedding to represent each word from the document in a vector format has shown to achieve impressive results and outperform the traditional vector representation method. In this paper, we proposed a document classification model that will make use of the word embedding as a vector representation of words in enhancing the overall performance of the document classifier. Our method is to initially preprocess our training dataset using the 20-Newsgroup dataset in order to add supplementary features by incorporating the proper Part-of-Speech (POS) tag to each word in the document. The preprocessed data enriched with additional semantic information will be used to generate custom-built word embedding vectors using the word2vec and fasttext word embedding algorithms. Finally, we train a neural network classifier using the custom-built word embedding vectors to evaluate the effect of our method. With minimal fine-tuning of the parameters of the neural network, our proposed classification model has improved the accuracy of the baseline word embedding methods. It was also observed that our model outperforms some other traditional classification models implemented using different techniques and other machine learning algorithms.

# The Impact of Brand Management Practices on Customer Switching Behavior: Retail Stores Brand Loyalty Pursuits

**Jaine G. Magpantay**, World Citi Colleges- Quezon City

**Kathleen U. Pulmones**, World Citi Colleges- Quezon City

## ***Abstract:--***

Brand management initiatives and efforts gradually come forth. Today, it is imperative for businesses to expand online, create multi-level marketing schemes for their brands and a combination of both strategies to gain leadership in the market. Consumer behavior is equally contributory to the brand switching pattern of consumers or customers. Numerous factors influence buyers to change brands besides individual determinants. This study participated by 200 customers in Metro Manila assessed the brand management practices and status of fashion retail stores customers' switching behavior focused on brand leadership, customer and market, human resource (HR), and process management in terms of service encountered, price, and competition. Statistical limits with a 4-point Liker Scale, with corresponding verbal interpretation were adopted for the Linear Regression Analysis of the brand management practices to the status of customer switching behavior was used in the study. Results of the study revealed that customer and market focus ( $p=.009$ ), Human Resource focus ( $p=.021$ ) and process management ( $p=.035$ ) are significant predictors of fashion retail stores customers' switching behavior. It also shows that brand management practices have significant impact to the status of customer switching behavior. An action plan is highly recommended and adapted for better quality management.

# Level of Awareness and Perception of Sectoral Groups on Economic, Physical, Psychological, and Sexual Abuses Committed By the Perpetrators under Ra 9262: Or Violence against Women and Children Act

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## ***Abstract:--***

The research determined the level of awareness and perception of sectoral groups as regards economic, physical, psychological, and sexual abuses committed by the perpetrators to their wife and children under the Republic Act 9262 or Violence Against women and Children Act. The study employed the descriptive research, involving the 460 respondents. Data were analyzed using the frequency percentage, arithmetic mean, F-test, Chi square test, Correlation Coefficient  $r$  – test.

Research findings concluded that majority of the respondents were 40 years old and below, female, married, affiliated to Roman Catholics, college graduates, employed as office workers, teachers and barangay officials, with monthly income of 10,000 and below; and lived in the rural areas of Tumauni, Isabela. Respondents expressed full awareness and strong agreement on economic, physical, psychological, and sexual abuses, with acts as very seriously committed by husbands to their wives.

Those male respondents, young, single, Roman Catholics, with higher education, employed, low monthly income, and living in the rural areas tended to become more knowledgeable of the economic, physical, psychological, and sexual abuses as provisions of RA 9262 than their counterpart. Male respondents, young, single, Roman Catholics, with high education, employed, with low monthly income, and living in the rural areas tended to show stronger agreement on the provisions of economic, physical, psychological, and sexual abuses of RA 9262 as very serious acts of violence committed by husbands against women and their children.

The more that the sectoral groups are knowledgeable of the economic, physical, psychological, and sexual abuses as provisions of RA 9262, the stronger is the perception on the provisions as very serious acts of violence committed by husbands against women and their children.

## ***Keywords:***

Awareness, Perception, Economic violence, Physical violence, Psychological violence, and Sexual violence, Sectoral Groups, RA 9262

# The Level of Compliance on Crowd Management in an Emergency Situations

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**Katherine Y. Cadalo**, Dean, World Citi Colleges

**Cheryll bernadette Palacio**, Faculty, World Citi Colleges

## *Abstract:--*

The rise of cruising industry in tourism attracts more travelers to choose the one pack and unpack holiday. Millions of people go from place to place, visit, and experience different cultures. However, with the huge influx of passengers that goes on cruising, safety became the primary concern. Crowd control is the big issues in an emergency and how to handle huge crowd in order to minimize life losses is where this study comes into place. This descriptive study determines the compliance of officers and crew in active service from 2010-present of the two shipping lines (n1=137; n2=138). Using the regulations coming from the International Maritime Organization (IMO) via Seafarers Training, Certification and Watchkeeping (STCW) in handling situations namely; preparedness, response, recovery, and mitigation in order to weigh the veracity of the regulations applied. Although, the two shipping companies have different approach in dealing with emergencies, result of the T-test revealed that there is no significant difference between the levels of compliance of the two shipping lines in handling the situations. This underscores the need for continuity and improvement in handling an emergency in order avoid or minimize losses and to make cruising a much safer holiday for everyone.

## Experience Beyond Borders through International Internship: Impact to Career, Culture and Life

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### ***Abstract:--***

This study analyzed the impact of the J1 - USA Internship Program among newly graduates in the Philippines on their career development, cultural understanding and life. The study utilized the available data gathered from the accomplished evaluation form (qualitative and quantitative) of the returnees for the last three years (2016, 2017, and 2018). A total of 251 respondents (153 females and 62 males) graduated from fifty (50) Philippine Higher Education Institutions were included. Data showed that they had positive general point view on the process, objectives and expectations on international internship and found them beneficial for their future career, better cultural understanding and life expectations. In the qualitative themes, majority of the respondents confirmed the positive impact to their start-up career and career development; they were able to adapt with the diverse culture and business standards at same time shared their culture to their team; and showed positive attitude towards various challenges in life they encountered during their stay. Negative responses were addressed during their program and considered for further improvement of the program.

### ***Keywords:***

Internship, International, Culture

# Franchising Business in the Philippines Setting: Case Analysis

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## ***Abstract:--***

Franchising is based on a marketing concept which can be adapted by an organization as a strategy for a business expansion. Most people who are planning to start or build a business usually choose to franchise a well-known restaurant so they could avoid having problems like bankruptcy or taking the risk in starting their own restaurant or business. In the field of Hospitality industry, it is normal to have a business or to franchise a business, not only in the Philippines but also worldwide. By franchising, there are many companies and restaurants that became widely known locally and internationally.

This descriptive research aims to determine the advantages and disadvantages of business franchising, identify the risk factors of franchising restaurants and distinguish the factors that contributes to the decision making of entrepreneurs to choose franchising a business that will then help the researchers to write a case analysis on how to franchise a business in the Philippine setting. The researchers prepared sample questionnaires that will be answer by the respondents in order to collect precise answers. This study will make use of the explanatory methods of research approach. Based on the analyzed data, most of the franchisors and entrepreneurs think that start-up assistance is one of the advantages on franchising restaurants, to be followed by marketing, name recognition, experience of franchisor and proven system operation. Aside from the long-term content, sole sourcing, being dependent on franchisor's success and limited creative/flexibility, the entrepreneurs and franchisors think that royalty payments are one of the biggest disadvantages of franchising because aside from the franchise fee, after a year the franchisor will also pay a royalty fee. To be a successful franchisor, the entrepreneurs and franchisors think that being a risk taker is one of the most common traits that a successful franchisor should possess.

The researchers' main point in franchising a business is, entrepreneurs need to be careful and peculiar because it's not just the money is being invested to it but also efforts and hope. Starting a business is not that so easy. There's a need for knowledge to know everything starting with the place for the business and also study the target customer.

## ***Keywords:***

Franchising, Hospitality Industry , Expansion, Entrepreneurs, Franchisors

## Perception on the Impact of Bullying to the Selected High School Students' Academic Performance

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### ***Abstract:--***

Education is essential for everyone. It is an indispensable part of life both personally and socially, undeniable for every single person. To get the most out of a good education, children need to go to school every day. Unfortunately, there are some hindrances to the attainment of education, and one of which is the problem on bullying. Nowadays, perhaps more than any other school safety problem, bullying affects students' sense of security. It is a problem that not only affects the education of children, leaving them scars not only physically but psychologically as well. This study aimed to determine the relationship of bullying and academic performance that may help solve problems on bullying of students in schools. It made use of the descriptive-survey method of research to accomplish the task of identifying the forms, causes and effects of bullying in schools. Simple random sampling was used in selecting the respondents- students, teachers and parents as well. The records in the Guidance Office were utilized in order to acquire the needed information regarding the profile of the students who had bullying cases in the school. A total of 240 served as respondents, 80 students, 80 parents and 80 teachers. The respondents were from the different public and private high schools in the City of San Jose del Monte. Majority of the respondents considered "Problems at home" as the most common reason why students bully others. In terms of academic performance, most of the student respondents were within the Developing level or grades 75%– 79 %, and lastly, there was a significant relationship between the student respondents' academic grade when grouped according to gender and birth order.

### ***Keywords:***

bully, bullying, academic, performance, causes of bullying, effects of bullying



# Energy Profiling and Residential Load Shifting Mechanism with Cost Reduction Using Genetic Algorithm

**Christine C. Bautista**, Dean, College of Engineering & Architecture, University of Nueva Caceres

**Michael C. Pacis**, Professor, Mapua University

## ***Abstract:--***

A growing number of residential consumers despite high electricity costs in the provinces largely impart to the overall power market situation in the Philippines resulting in high emission generating units adding harm to the environment, coal dependency and supply shortage, especially during summer. Demand Side Management (DSM) aims to encourage consumers to use less energy during peak times. Demand Response (DR) is a type of DSM towards conserving the use of energy to reduce system peak demand and operational cost. This paper proposed a metaheuristic demand response mechanism for residential consumers to reduce consumers' peak demand and minimize electricity cost via Genetic Algorithm load shifting without affecting the consumers' conveniences. Further, the paper assumed that the energy market is existing and published hourly energy prices a day ahead and that the hourly demand of household consumers is known through a load forecast using Weighted Least Square. Furthermore, the flat iron and washing machine are the identified appliances the consumers' willing to use during non-peak hours. The process was simulated through MATLABr2018a in generating the best-fit combinations for load shifting.

# Urban Tourism Master Development Plan for the City of Ilagan, Isabela Province Philippines

**Bagnos A. Quebral Jr.**, Department of Architecture, Isabela State University, City of Ilagan

***Abstract:--***

A lot of cities made urban tourism as their major industry in boosting economic growth and involving urban regeneration projects that enhanced the physical, cultural, social, and environmental and heritage richness of their place. With the fast urbanization of the City of Ilagan, Isabela, urban tourism is one of the vital focuses on the development that created a sense of pride and identity for the city. At present, Isabela Province is being left behind by its neighboring provinces like Ilocos and most of the tourists are not yet familiar with the place. Through urban tourism, the needs of the city had been re-imagined to make it more innovative and reliable in terms of adequacy of facilities, appropriateness of tourist attractions, effectiveness of amenities, and accessibility of tourist spots. This also improved and maximized all tourism potentials and discovered new tourism experience by means of having an in-depth planning study and providing long-term urban design solutions for sustainable development. The study revealed that most of the respondents are in favor of upgrading the tourism facilities of Ilagan, Isabela. As a result, the urban tourism master development plan for the city of Ilagan made Ilagan one of the premier tourist destinations in Northern Luzon.



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