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# Report of the Proceedings

of the

## 11<sup>th</sup> PACUIT National Conference

held in collaboration with

Colombo Plan Staff College for Technician Education

and

Cebu Technological University

April 22-24, 2013, Cebu Bussiness Hotel  
Colon Street, Cebu City

Theme: *Harnessing Quality Assurance to Meet the Challenges of the  
New and Emerging Technology*

Philippine Association of Colleges and Universities of  
Industrial Technology (PACUIT), Inc.

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**PHILIPPINE ASSOCIATION OF COLLEGES AND UNIVERSITIES OF  
INDUSTRIAL TECHNOLOGY (PACUIT), INC.**

**Proceedings of the 11<sup>th</sup> PACUIT NATIONAL CONFERENCE held on April  
22-24, 2013 at Cebu Business Hotel, Colon Street, Cebu City**

*in collaboration with*

**Cebu Technological University and Colombo Plan Staff College for  
Technician Education**

*Theme: “Harnessing Quality Assurance to Meet the Challenges of New and  
Emerging Technology”*

The 11<sup>th</sup> PACUIT National Conference was held on April 22-24, 2013 at Cebu Business Hotel, Cebu City in collaboration with the Cebu Technological University in Cebu City and the Colombo Staff College for Technician Education in Pasay City, Philippines. The theme of the Conference was: “Harnessing Quality Assurance to meet the Challenges of New and Emerging Technology”

The three-day conference was attended by 243 participants from 40 member- institution of the association and from 9 other higher education institution in the Philippines, and invited resource speakers. The participants include SUC Presidents, Deans, Professors, Instructors and Researchers.

### **The Registration of Participants and Guests**

The registration of participants started at 7:30 in the morning of April 22, 2013 under the leadership of Dr. Corazon P. Machor of Cebu Technological University. The registered participants were served breakfast and accommodated immediately in the hotel.

## **The Opening Program**

The program started at 10:30 in the morning of April 22, 2013 with a Doxology which was followed by the singing of the Pambansang Awit, and Sugbo, led by the CTU Chorale. The opening remarks was delivered by Dr. Luis M. Sorolla, Jr., President of Western Visayas College of Science and Technology and Corporate Secretary of PACUIT. The highlight of his remarks was on the need for Quality Assurance which was complementary to the theme of the conference, “Harnessing Quality Assurance to meet the Challenges of New and Emerging Technology”. He then introduced the guests and participants coming from the different Institutions in the Philippines.

Dr. Bonifacio S. Villanueva, President of Cebu Technological University and PACUIT Vice President for Visayas welcomed the participants and guests as host of this year’s conference. He stressed that the conference was a timely venue to address the challenges by Industrial Technology Program in this rapidly changing world. Dr. Villanueva emphasized the need to prepare ourselves to face the challenges of new and emerging technologies. He assured the participants that as President of his Institution together with the organizers, assistance will be available to everyone when needed.

Dr, Perfecto A. Alibin, President Southeastern University of the Philippines and PACUIT President was exited and happy to welcome the Presidents, Vice Presidents, Deans, Professors and Researchers to the conference. He was delighted to inform that the Association is getting stronger and bigger. He thanked Dr. Bonifacio Villanueva for hosted the conference. He assured the group that they are welcomed in Davao City to next year’s conference. It was his hope and expectation that everyone will find the three-day conference fruitful and meaningful.

A video was shown with Dr. Mohammad Naim Yaakub, Director General Colombo Plan Staff College for Technician Education giving his message since he was unable to come due to an international commitment. In his message, Dr, Naim expressed his happiness to partner with PACUIT in this very important conference. He was happy to note that three institutions in the Colombo Plan Countries will be awarded by the Asia Pacific Accreditation and Certification Commission (APPACC) of their Certificate of Accreditation during the conference. He further

stressed in his message the importance of Quality Assurance to different stake holders of Technical and Vocational Education and Training.

### **The Keynote Address**

The keynote speaker was Dr. Amelia A. Biglete, Regional Director of CHED Region VII, Central Visayas. Director Biglete was introduced by Dr, Cecilio S. Baga, Vice President for Research and Development of Cebu Technological University.

Her keynote address focused on CHED CMO No. 46, Series of 2012, entitled “Policy-Standard to Enhance Quality Assurance (QA) in Philippine Higher Education Through an Outcomes-Based and Typology-Based Quality Assurance”.

Director Biglete pointed out that: “Philippine Higher Education is mandated to contribute to the building of a quality nation capable of transcending the social, political, economic, cultural and ethical issues that constrain the country’s human development productivity and global competitiveness”. Thus the needs for enhancing quality assurance in Philippine Higher Education.

She Stressed that the Mission of Philippine Education are the following:

1. Produce thoughtful graduates with a humanist orientation; analytical and problem solving skills; ability to think through the ethical and social implications of a given course of action; and the competency to learn throughout life;
2. Produce competent graduates for work in the 21<sup>st</sup> century
3. Provide focused support to the research required for technological innovation, economic growth and global competitiveness and the crafting the country’s strategic directions and policies;
4. Help improve the quality of human life, respond effectively to changing societal needs and conditions; and provide solutions to problems at the local community, regional and national levels.

The other focal point of interest in her keynote address was on Quality Assurance Framework and the Rationale for Competency-Based Learning Standard and outcomes-Based QA.

Day One April 22, 2013

### **Afternoon Session**

There were two plenary sessions in the afternoon of April 22, 2013, first day of the conference which were presided Dr. Cecilio S. Baga, Vice President for Research and Development, Cebu Technological University.

### **Session No. 1**

The first topic, **Alternative Construction Technologies for reinforced Low Cost Housing, Utilized Bamboo in the Philippines,**” was discussed by Engr. Daniel David Jimenez, a visiting Fulbright Scholar of Massachusetts Institution from Technology. He has a BS in Civil Engineering and MS in Engineering from MIT.

The paper was based on a research conducted by the author with the main objective to incorporate reinforced alternative construction technologies into low-cost housing enterprises in the Philippines. More specifically, the study presented, aimed against poverty and introduced safeguard against natural disasters which frequently occurred in the Philippines.

The author conducted feasibility study on the use of Bamboo and other low-cost construction materials with end in view to develop and select appropriate technology to implement sustainable housing enterprise. His partners in this endeavor were the Cebu Technological University, Cebu Institute of Technology: A University, and Gawad Kalinga.

The presentation of Engineer Jimenez brought out the following points:

1. Around 19 typhoons per year in the Philippines; only 17 hurricanes In the US,

2. The typical construction materials in the Philippines: Earth, Wood, Masonry, Steel, reinforced concrete and structural glass,
3. There is a need for alternative construction technologies,
4. Current low-cost building technologies in the Philippines
5. Current low-cost building technologies in the Philippines
6. Institutions promoting the utilization of Bamboo for building construction

He suggested among other things to

1. Select and localize the use of bamboo as construction materials for low-cost housing
2. Develop low-cost Bamboo Home Technology
3. Promote the use of Bamboo-Plastered refracted wall.
4. Prototype and demonstrate low-cost bamboo house technology
5. Raise public support for low-cost bamboo house technology
6. Encourage GK Communities to use Low-Cost Bamboo House Technology

## **Session No. 2**

The second session presenter was Mr. Edwin T. Tesaluna, Science Research Specialist of the CTU-Affiliated Renewable Energy Center (CTU-AREC). His topic presentation was titled: **Renewable Energy 101/Photovoltaic Systems”**.

The speaker started his presentation by focusing on the following renewable energy potential of the country as follows:

1. Geothermal >4,000 MW, ranks 2<sup>nd</sup> world producer
2. Wind resource > 76,000 MW
3. Hydropower > 10,000 MW
4. Solar > 5 KWh/m<sup>2</sup>/day
5. Ocean > 170,000 MW
6. Biomass > 500 MW (biogases and rice hulks only)

The national renewable Energy Programs includes the following:

1. Increase renewable-based capacity by 200% within the next 20 years (2011-2030) increase non-power contribution of renewable to the energy mix by 10 MMBFOE in the next ten years.

2. Be the number one(1) geothermal producer of the world(additional 1,495 MW).
3. Be the number one(1) wind energy producer in the Southeast Asia (up to 2,500 MW)
4. Double hydro capacity (additional 5,400 MW).
5. Expand contribution of:
  - Biomass- 256 MW
  - Solar – at least 280 MW
  - Ocean Energy – at least 10 MW

The **open forum** followed after the presentation of the two resource persons. The questions raised were evenly distributed for both topics. The open forum was facilitated by Dr. Baga. The interaction was lively and enlightening.

The plaque of recognition and token were awarded by President Perfecto A. Alibin and President Bonifacio S. Villanueva to the resource persons.

Day Two, April 23, 2013

### **Morning Session**

**The Morning Session** started with an opening prayer and the singing of the Pambansang Awit led by the Dr. Hubert G. Quinones, officer of the day. After invoking the blessing of the Divine Providence, Dr. Quinones turned-over the conference proper to Dr. Cecilio S.Baga of CTU to preside. Dr. Baga introduced the resource person, Ms.Veronica Paclibar of TMX Philippines, Inc.

Session No. 1

The title of her presentation was, “**Supply Chain Management**”. Ms. Paclibar introduced her presentation by emphasizing that “Supply Chain Management is critical to the success of modern organization”. She stressed that” it is now recognized as an important strategy to operational efficiency and creating customer value and loyalty”. She then proceeded to present the outline of presentation as follows:

- Introduce the basic concept of Supply Chain Management
- Define its various Functions
- Understand the Roles of SCM

- Expound SCM Implications in the Academe

An introduction of the basic concepts of Supply Chain Management was discussed wherein its different functions were being defined as well as the challenges that is faced by Supply Chain Management.

She narrowed out the purpose of Supply Chain Management as a set of approaches used to efficiently integrate suppliers, manufacturers, warehouses and distribution centers. It is important that products are produced and distributed in the right quantities, location and time. Its purpose is also the minimization of operational or system-wide Cost and optimization of the Service Level or Customer Satisfaction.

The challenge now in the academe is the application of Supply Chain Management so as to bridge the requirement gap, matching demand and supply, and sustainability in the constancy of evolving demand.

## **Session No. 2**

**The second topic** of the Morning Session was:”**Strategies in Integrating Environmental Management to Tertiary Instruction and Research**”, was discussed by Dr. Ruth S. Guzman, President Philippine Association of Tertiary Level Education Institutions in Environmental Management (PATLEPAM) Dr. Guzman was introduced by Dr. Renato V. Alba, Executive Director of PACUIT. Dr. Guzman started her presentation with the paradoxes of our time in history.

She stressed the need for sustainable development and a better environment since the rapid industrialization of our time has defeated the purpose of sustainable development. The need for sustainability is very important because we are dealing with the finite resources which will evidently be depleted. In fact, as they say the next global war would be because of the issue of water considering that only 3% of our water is potable while 97% is salt water. With the 3% potable water, only 1% is accessible since the remaining 2% is locked up in glaciers.



Thus the need for us to take steps towards sustainable industrial development through closing the loop through RE-USE and Recycle.

She also stressed that the biggest hindrance of global development is how to combat climate change. Global Warming is a clear manifestation of unsustainable path – increasing climatic uncertainty further compounding our development challenges

The most effective way to address climate change is to adopt sustainable development pathway through the 3 E's which is Education, Engineering/ Technology through innovation and Enforcement of the people through the provision of Environmental Laws.

The era of “grow first, clean up later” is over. Green growth or green economy is now the direction of global economy. An important antecedent of green growth is sustainable development through the pillars of the sustainability of economic growth, social development and environmental protection.

Thus, the role of the academe is to integrate climate change adaptation into the tertiary curriculum since it has great impact on the different sectors of our country. The following are vulnerable to climate change: our ecosystem, food security, water resource, human health, infrastructure, energy, and the human sector.

Through adaptation strategy and migration, we could work to attaining our vision which is to have a climate risk-resilient Philippines with healthy, safe, prosperous and self-reliant communities, and thriving and productive ecosystems. Thus, the academe response is: To act now before everything goes up in smoke.

**The open forum** followed after the presentation of the two resource persons which was facilitated by Dr. Baga. The questions raised were evenly distributed for both topics. The interactions showed the relevance of the topics to the academe.

The Plaque of Recognition and token were awarded by President Perfecto A. Alibin and President Bonifacio S. Villanueva to the resource persons.

### Session No. 3

The Chair for the **Third Session** was Dr. Renato M. Sorolla, President of Carlos Hilado Memorial State College and a Trustee of PACUIT. He introduced the third Resource Person of the Day; Dr. Mohammad Naim Yaakub Director of the Colombo Plan Staff College. Dr. Yaakub was represented by Dr. Hazrat Hussain, a faculty Consultant of CPSC. In his presentation, **“Quality Assurance through International Accreditation”**, Dr. Hussain introduced the topic by discussing Global Labor Mobility which is the future trend. He pointed out that many of the Asian people go to North America, Europe, U.S., and Dubai to work. However, even in developed countries, some of our workers are not protected against exploitation. Some are given salary packages lesser than what they deserve. Others are even living in poor conditions, thus, the need for intervention to address this case.

This is what is addressed by international accreditation system such as APACC (Asian Pacific Accreditation and Certification Commission). APACC’s inception is guide Technical Education Training (TVET) Institutions in equipping themselves with Internationally-Recognized Qualification skills, and to harmonize the quality of TVET in the region and facilitate quality improvement programs.

The benefits of accreditation through APACC are the following: international recognition of quality, employer and public confidence, quality-assured and employment-ready graduates, regional mobility of workforce and qualifications, quality improvement drive, and regional network of quality-assured institutions, in fact, in the Philippines a total of 20 Institutions are already accredited. The 1<sup>st</sup> accredited TVET institution is TESDA Women Center in the Philippines.

After the presentation of Dr. Hazrat Hussain, the awarding of APACC Certificates of Accreditation to Three Technical Institutions from Mongolia followed. The certificates of Accreditation were individually presented to Dr. Erdenetsetseg Myagmar, Mr. Otgonbayar, Mrs. Enkhjargal. Dr. Erdenetsetseg Myagmar, the leader of the group, delivered her acceptance and appreciation speech for the three institutions.

The open forum moderated by Dr. Renato M. Sorolla followed immediately.

## **Research Paper Presentation**

The conference theme: **”Harnessing Quality Assurance to meet the challenges of New and Emerging Technology,”** was the frame of reference of the papers accepted for the presentation starting at 1:30 in afternoon of the second day of the conference, April 23. The paper presentation were grouped into six tracks, namely: 1) Administration/ Management of Industrial Technology Program, 2) Teaching Innovation, 3) Electricity Electronics/ Automotive and Control Systems, 4) Automation and Control Systems, 5) Innovation and 6: Food Processing, Packing, Handling, and Storing.

### **A.1 Administration/ Management of Industrial Technology Program**

**Session Chair: Dr. Cecilio S. Baga**

Vice President for Research and Development,  
Cebu Technological University

#### **The BIT Mechanical Program of Batangas State University: Its Response to the Emerging Needs of Industry in Batangas Province**

Gardiano Evangeline Bunghao Batangas  
Batangas State University  
[ebughaogardiano@yahoo.com](mailto:ebughaogardiano@yahoo.com)

The study aimed to assess the BIT Mechanical Technology of the Batangas State University. A descriptive type of research was used to assess the responsiveness of the BIT Mechanical Technology Program to the emerging needs of Industries in Batangas Province.

The findings of the study showed that the BIT Mechanical Technology program complements with the varying and changing needs of Industry. The program manifests responsiveness as expressed in its curriculum, mark process indicators, manipulative skills development and provision for Industrial work experience.

## **BS Mechanical Engineering, Major in Automotive Engineering**

Defensor, Godofredo P; Jacuman, Rolando F.,  
Iloilo City: Western Visayas College of Science and Technology.

The paper presentation covered the development of BS Mechanical Engineering with major in Automotive Engineering as proposed by the Toyota Motors Philippines Foundation to the College. The program approved by the Board of Trustees of the college met the requirements of CHED as stated in its Policies and Standards for BS in Mechanical Engineering. The paper further discussed the implementation of the program and the performance of graduates in the board examination. Finally, the placement of the graduates was reported. A case study method was used in the study.

## **Valve Spring Compressor Device for Internal Combustion Engine**

Braña, Adrian Uniate  
Manila: Technological University of the Philippines

The “Valve Spring Compressor Device for Internal Combustion Engine” was developed to provide an effective device that is easy to operate and substantially reduces downtime and over hauling cost. The valve spring compressor was evaluated by twelve experts who were randomly selected. They rated the device in terms of its functionality, aesthetics, economy, safety, workability efficiency, and marketability. It obtained an overall mean of 4.9 which translates as highly acceptable. It is recommended and intended to be used by automotive mechanics in the process of overhauling and as a preventive and maintenance tool.

## **An Innovative Technique in Engineering: The Mechanical Properties of Sheets Metals**

Namoco, Consorio S.  
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The effects of the embossing and restoration on the rigidity of sheet metals were investigated. Soft aluminum (AI-O), Mild Steel (SPCC) and stainless steel (SUS) sheets of different thickness were subjected to embossing and restoration process at different patterns.

The result showed that the proposed technique is an efficient way to improve the strength of rigidity of thinner sheets metals, which leads to the reduction of the formed parts. The

combined positive effects of embossing and restoration make LDR appreciably larger compared with that obtained by using a plain sheet specimen during deep drawing, hence enhancing the formability of the sheet.

### **Open Forum and awarding of certificates of recognition to the presenters**

#### **A.2 Teaching and Innovation**

##### **Session Chair: Renato B. Salmingo**

Vice President for Research and Development  
Carlos Hilado Memorial State College

##### **Development and implementation of Low-Cost Pedagogic Tools in Computer-Aided Design and Computer-Aided Manufacturing Course in Technology**

Cuasito, Sr., Ruvel J.

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The study highlights the development and implementation of locally assembled CNC machines that performs the milling and lathe machining operations. The study presents compelling arguments on the need to address skill set demands in modern computer-aided manufacturing amidst budgets constraints experienced by SUC's in the Philippines. The general objectives of the study sought to explore low-cost CNC machine design that can be replicated, retooled, retrofitted, and assembled utilizing readily available components in the locality. Specifically, the study focused on the design, prototyping, implementation, and performance evaluation of the prototypes that were explicitly described in the methodology of the research.

The fundamental design follows an open-loop control system that operates without verifying the actual position of a specified tool position. The system do not have complete feedback control system which means that operation errors are not evaluated and corrected. The prototyping process involves the development of the power supply, the stepper motor circuit driver, the use of programming software, and the appropriate materials design. The performance evaluation of the CNC machine were assessed by comparing the actual and simulated displacements based in designed parameters executed. Corresponding measurements were conducted to validate accuracy and complementary measures were made to compensate and

correct errors. The featured CNC milling and lathe machine are more cost efficient compared to existing commercial mobile robots for education. The researcher recommended that the pedagogic tool will only use soft work piece to preserve its efficiency.

### **C++ Programming Compilation Log and Data Mining in Education**

Gamboa, Randy S.

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The researcher applied data mining in extracting information from students' DevC++ Compilation Log. Dev C++ IDE was modified to capture students' compilation logs, written in text files and forwarded to the server. Text files containing log information were sent to Dev C++ Log Miner; these were analyzed to generate visualization and interpretation of results. Visualizations and reports generated reliable information such as error count per compile, committed error count, compile time interval and character count per compile to determine novice students' programming performance and challenges.

Generally, the system was able to extract information from the collected generated text file that contains the compilation log information of every student participant. In extracting the information; the researcher used the data mining approach that provides a summarization of the useful information. The information were successfully classified according to total number of errors committed, character count, compile time interval and the success compilation rate of the subject.

### **Development of an Automotive Charging System Trainer with Safety Device.**

Balbin, Nicanor B.

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Charging system plays vital role in the automotive electricity. Although most of the automotive technology students have familiarized the wiring diagram, they found difficulties in installing or connecting the actual wiring circuits; often times resulted to damages in charging system components. This charging system trainer with safety device was developed through the R & D Process to enhance the knowledge and skills of automotive technology students on

troubleshooting and connecting or installing the charging wiring circuit. It was found out that this device provides safety feature for the whole system and the user with the use of inline fuse in the different electrical wire; in case of shore circuit or wrong connecting, the fuse gives up instead of damaging the whole system or causing fire. The device likewise achieved zero air pollution through the use of electric motor instead of petrol engine. It offers technical advantages such as: facilitate T-L process and improve the quality of output, provide troubleshooting activities on defective alternator, defective voltage regulator, run-down battery, faulty wiring connection, open and short circuit and belt tension. It provides economic advantages like: eliminates an expensive petrol engine that basically drives the alternator, electrical consumptions is obviously lesser than gasoline or diesel fuel. High-Cost components are protected by a safety device for possible damages due to faulty connection.

### **Open Forum and awarding of certificates of recognition to the presenters**

#### **B.1 Electricity/ Electronics/ Automotive and Control Systems**

**Session Chair: Dr. Joseph Pepito**

Professor, Cebu Technological University

#### **Prototype and Laboratory Manual Development of an Automation Trainer**

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Taguig City: Technological University of the Philippines

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The Automation Trainer was first designed on an on-off mode only. The design was modified for the system to operate also in proportional mode of control, whenever applicable. One major consideration in designing industrial control systems are the specifications of the devices to be used. There are many types of devices in the market to choose from, the designer just need to identify the specification of the device that would suit the need of the designed system process operation. For example, the temperature transmitter that was used can operate in either on-off or proportional control but the on-off feature only was used because the specifications of heating and cooling elements used are not capable to response on a proportional command. The same with the Ultrasonic level sensor, this device is highly sophisticated in terms of technology but the proportional control it could provide is not utilized because the correcting devices used (solenoid valves) are on-off types only. It is then necessary that students should

understand each hardware components of a complete system to be able to successfully understand automation and control.

With the incorporation of the GUI in the system, which originally not included in the design, real time monitoring of the status of the process variables were made possible. GUI and PC programming of the PLC provides students with hands-on experience that is close to the actual industrial setting. Basic as it is, but an existing equipment and a laboratory manual that goes with it provides the need in teaching-learning experience of the teacher and the student be successful.

### **Design Development of Variable Frequency Chicken Stunner**

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The “Variable Frequency Chicken Stunner” was designed and constructed in order to address the risks upon using a stunner in slaughtering chicken. This study is important because if the stunner’s voltage is too high and has low frequency, the chicken would be dead before slaughtering. This will cause the chicken meat to be haram (forbidden to be eaten by Islamic law). Moreover, chicken which are dead before slaughtering would cause the bleeding process to be imperfect, which will cause the chicken meat to change color. If the stunner’s voltage is too low and still has low frequency, the effect would be that the chicken would still be conscious, thus complicating the slaughtering process.

This project is capable of performing 3 frequency outputs: low frequency = 100Hz, medium frequency = 500Hz and high frequency = 1500 Hz. It has 12 VDC supply voltage and is safe to use.

### **Oil Immersed Tungsten Inert Gas (TIG) Toroid Welding Machine**

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The presentation covered the design, Construction and operating performance of an Oil Immersed Tungsten Inert Gas (TIG) Toroid Welding Machine.



The operating performance of an Oil Immersed Tungsten Inert Gas (TIG) Toroid Welding Machine demonstrated the following: 1) The Oil Immersed Tungsten Inert Gas (TIG) Welding Machine, can operate in 30 minutes continuous duty with less energy consumption and is more efficient, 2) The machine can be operated in a 30 minute continuous duty because of its main winding and reactor winding toroidal design that can resist heat dissipation to the winding, 3) The machine is efficient because of its higher inductance toroid core that provides a closed magnetic path. Magnetic flux in a high permeability toroid is largely confined to the core. The winding voltage and current output is stable with minimal power losses, 4) The machine can withstand its temperature requirements. The transformer oil will serve as an insulator as well as the coolant of the main winding, 5) The machine has less energy consumption. The circulating current or the no load current is 0.04 ampere. This is very advantageous as compared to other machines. The confinement of the coil to a toroidal core reduces the energy that can be absorbed by nearby objects, so toroidal cores offer some self-shielding.

### **Open Forum and awarding of certificates of recognition to the presenters**

## **B.2 Automation Control Systems**

**Session Chair: Dr. Joseph Pepito**

Professor, Cebu Technological University

### **Design and Development of Etching Machine**

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The demand for having an etching machine that would work safely in stirring up the ferric chloride was needed since ferric chloride was highly corrosive solution that can cause burn to any area contact. Ferric chloride was also harmful if swallowed or inhaled. Ferric chloride was a chemical and should be handled with respect (Hoskins and Pearce, 1984). These were some of the major problem encountered in the use of manual etching PCB which is time consuming and the stain of the ferric chloride affected the quality of the product. With these problems in mind the researcher conducted this study.

The study was designed to come up with an etching machine. Specifically, it aimed to 1) Design a circuit and program for etching machine, 2) Construct a circuit and program for etching machine, 3) Test the functionality of the circuit and program for etching machine and 4) Revise any defects found during testing.

The project was successfully designed, developed, and tested. Pilot testing was conducted to test the functionality. Same with, defects encountered were given appropriate remedies.

### **Design and Construction of Automated Security Lock**

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This study was conceptualized because of the widespread and emerging technologies nowadays. It is observed that the commercial buildings, pawnshops, houses, and banks utilized modern gadgets and devices to control entry of persons. It sought to innovate, design, construct, test, and revise an automated security lock.

The result showed that a different automated security lock can be innovated, designed, and constructed to form a functional automated security lock, by using locally available supplies and materials with the use of our existing technology and through one's occupational competencies. Furthermore, that the automated security lock can be tested, evaluated, and revised to determine its functionality.

In conclusion, the functionally designed automated security lock can be used in most of the homes, offices, commercial buildings, pawnshops, and banks for security purposes.

### **Programmable Motor Controller: An Instructional Model**

Minerva, Pablo Jr.  
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The presentation covered the design, construction and functionality of a Programmable Motor controller: an Instructional Model.

The programmable motor controller is a microprocessor-based system that accepts input data from switches/ sensors, processes that data by making decisions in accordance with a stored program, and then generates output signals to devices that perform a particular function based on the desire application.

The programmable motor controller is highly acceptable in its design, construction and functionality as evaluated by electrical/electronics and electrical engineers in the academe and electrical engineers in the industries. This can be used as an instructional device by the instructors in the academe and a special gadget in the industry.

### **Design and Development of a Multi-Featured Electricity powered Round Table**

De Asis, Romeo M., San Diego, Alenogines L.  
Cagayan de Oro City: Mindanao University of Science and Technology

The study involved the design, development and evaluation of a multi-featured electricity powered round table. The innovation introduces an electricity controlled forward-reverse rotation of an electric motor that drives the center table using two (2) momentary pushbuttons at each chair position. Additional features include an MP3 ready player, a cell phone charger, an electrical two hundred twenty volts (220) AC voltage supply convenience outlet and lighting effects.

It is indeed possible to develop a multi-featured electricity powered round table without compromising four important aspects in the design; aesthetic, comfort, functionality, and flexibility. These aspects were used as the main criteria in the study conducted. The design and development of the prototype preserved both the aesthetic value and functionality found in singular tables, despite the fact that it is multi-featured electricity powered round table that can perform five distinct functions.

### **Short Message Service (SMS) Mobile Phone Based Early Warning Alarm System**

Alejandro, Benjamin B. ;Cabangal, Nico ;Duran, Glicerio Jr.; Guiuan, Jose II  
Dumaguete City: Negros Oriental State University

This research study was conducted to design and construct a Short Message Service (SMS) Mobile Phone Based Early Warning Alarm System and test the efficiency and its

functionality. This gadget is a complete remote telemetry unit (taking measurements at a distance).

It is operated by the user sending SMS text messages from any standard Mobile Phone in order to report the status. The user can directly control the outputs from a simple text message, and can also be notified when the inputs on Short Message Service (SMS) mobile phone based Early Warning Alarm System have been operated.

### **Open Forum and awarding of certificates of recognition to the presenters**

Day Three April 24, 2013

#### **Morning Session**

### **A.3 Innovation**

**Session Chair: Dr. Panfilo Ciriaco**

Professor, Cebu Technological University

#### **A Thermoelectric Water Dispenser**

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Thermoelectric heat pump is a solid-state active heat pump which transfers heat from one side of the device to the other, with consumption of electrical energy, depending on the direction of the current. It is a sandwich formed by two ceramic plates with an array of small Bismuth Telluride cubes (“couple”) in between. When an electrical current is applied across the junction of two dissimilar metals, heat is removed from one of the metals and transferred to the other.

The TER internal aluminum cold plate fins absorbs heat from the contents, (food and beverages), and the thermoelectric modules transfer it to heat dissipating fins under the control panel. A small fan helps to disperse the heat into the air. The system is totally environmental friendly and contains no hazardous gases, nor pipes nor coils and no compressor. The only moving part is the small 12-volt fan.

Thermoelectric refrigerator is environmentally safe it does not use any refrigerants which can cause severe damage to the ozone layer and harmful to human when this refrigerant gases is exposed with an open fire. This technology can be a replacement for a vapor compression in terms of a short cooling like water dispenser and even a small cooler because it does not need a very low temperature. This thermoelectric refrigerator can easy to carry because it does not have any refrigeration mechanism which includes compressor, condenser, evaporator, expansion valve and copper tubing, the only moving parts is the blower in which helps to transfer heat from the inside or the cooling space to the environment. Thermoelectric refrigeration is vibration free and no noise will be created during operation in terms of cooling the thermoelectric refrigeration operated with a 12V can cool a 5 gallon water.

### **Home and Office Appliance Protector: An Innovation**

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The power line fluctuations and cut-offs causes damages to electrical appliances connected to the line Unexpected appliance failures can be inconvenient, but worse, they can be costly. Covering the repairs of your heating and cooling systems alone can run into thousand of peso every single year. It is more serious in the case of domestic appliances like fridge and air conditioners. If a fridge is operated on low voltage, excessive current flows through the motor, which heat up, and get damaged and may even cause electrical fire.

It was therefore the hope of the researcher that this project will safeguard not only the life of the appliances but also for the homeowner, because the under/over voltage protection circuit with time delay presented here is a low cost reliable circuit for protecting such equipment's from damages. Whenever the power line is switched on it gets connected to the appliance only after a delay of a fix time. If there is high/low fluctuation beyond sets limits the appliance get disconnected. The system tries to connect the power back after the specific time delay, the delay being counted from the time of disconnection. If the power down time (time from which the voltage is beyond limits) is less than the delay time resumes after the delay: if it is equal or more, then the power resumes directly.

The following were the conclusion drawn from the results of the evaluations conducted by the researcher:

1. The present project introduces the broad concept of protecting cut-off switch as against a potentially harmful under/over current condition that short circuit I the load may cause
2. As reflected in all the results of the evaluation of the project was very stable in operation and can be used in any home and office electronics and electrical appliances.
3. The under and over voltage cut –off protection makes the project more important to use to safeguard the appliances in the event of the abnormal voltage.
4. The short circuit protection would sense excessive flow of current the fuse would blow and the system would shutdown making your appliances safely disconnected from the source.
5. The time delay of approximately 3 minutes and 15 seconds is good enough to consider that voltage are already in normal condition and in case of refrigerator and air conditioning unit 3 minutes is the allowable time limit that refrigerant and oil are balance in the system making the compressor to start at normal operation.

### **Multipurpose Machine for Silk-Screen Printing**

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This study aimed to design and construct a multipurpose machine for silk screen printing. Thirty experts which included drafting instructors, small scale printers, fine arts practitioners and evaluated the constructed machine. The researcher's-formulated questioner was used to gather information. Mean scores were used to determine the acceptability of the constructed machine according to its features. Results revealed that the detachable printing boards are highly acceptable. The dryer for coated silkscreen with photo chemicals and exposed photo chemicals and printed t-shirt was highly effective in terms of wattage and capacity. The photographic silk screen developer was highly effective when evaluated in terms of time exposure and washing. The folding lavatory was highly functional and highly durable. In terms of its operation, the t-shirt printing machine was rated as highly effective. Results likewise revealed that it s highly durable. It is recommended that the constructed multipurpose machine for silk screen printing may be used by faculty members as instructional device in teaching technology areas.

### **Open Forum and awarding of certificates of recognition to the presenters**

Day Three April 24, 2013

**Morning Session**

**B.3 Food Processing, Packaging, Handling and Storing**

**Session Chair: Dr. Glicerio E. Duran, Jr.**

Dumaguete : Dean CIT NORSU

**CHMSC's Food Processing and Laboratory Center**

Salmingo, Renato B.

Elbade, Arlene M.

Talisay City: Carlos Hilado Memorial State College

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Carlos Hilado Memorial State College, Talisay City, Negros Occidental through the major support of NEDA KR2 spearheaded the food processing and preservation development activities of the 50 residents of the five Barangays in the City of Talisay, namely: Efigenio, San Fernando, Concepcion, Cabatangan, and Matab-ang.

The project beneficiary were trained through a series of practicum activities in cooking/producing chips, pickles, peanut butter, Durian pastillas, candy bar, jam polvoron, garlic/glazed coated peanut, etc., as a good source of income generating projects for the Barangay.

The frequency and percentage were used as statistical tolls. The finding revealed that, 5 barangays has level up through series of in-service trainings on food processing, good manufacturing practices and has adopted food safety practices in the satellites centers, in the community and has diversified product components.

Products marketable has been farther reaching out not only fiesta, festival, celebrations and big events of the province, but also in adjacent region and even Metro Manila. An average of 50% of the trained beneficiaries were seriously engaged in direct food processing and a good number made use of the raw materials as initial start-up capital for business ventures. Success stories were documented as a result of the program implementation.

## **The Utilization of Brine Solution in Multi- Refrigeration and Air Conditioning**

Porras, Carlito O.; Candeliza, Romulo D.  
Iloilo City: Western Visayas College of Science and Technology

The presentation covered the design, construction and evaluation of a brine solution for multi-Refrigeration of a brine solution for multi-Refrigeration and Air-Conditioning System more specifically for cold storage, chillers and Air Conditioning System.

The study showed that the brine solution of mini ice plant can be utilized as a secondary Refrigerant for cold Storage chillers and air conditioning system. The system demonstrated a big saving in power utilization of brine solution multi- refrigeration and air conditioning system compared to a three system cold storage, chillers and air conditioning system if using individual compression. It is an innovation of an existing one system unit mini ice plant into three different storage system and air conditioning system using brine solution as secondary refrigerant with the intention to save power consumption.

### **Katmon Wine**

Chavez, Ma. Rovie A.; Marcaida, Rolando D; Intia, Binah L.  
Naga City, Bicol State College of Applied Science and Technology

This study was conducted to analyze the feasibility of Katmon fruit as raw material for wine. It aimed to answer the following objectives: (1) To indentify the processes involved in wine processing; (2) To determine the pH and alcohol content of the Katmon wine; and (3) To evaluate the acceptability of the Katmon Wine in terms of: a) taste, b) aroma, c) physical appearance, d) marketability.

The descriptive, experimental and research, and development processed were used in this study to show how Katmon was developed into wine.

The major conclusions of the study were: (1) Katmon fruit has the potential to become a wine. (2) In Preparing the wine, proper selection of Katmon fruits and sanitation must be observed in order to produce a good quality of wine. (3) the wine from katmon fruit is acceptable in term of physical appearance, aroma, taste and marketability. Katmon wine is found to be appropriate as table wine/sweet wine.

### **Open Forum and awarding of certificates of recognition to the presenters**



## **Last Plenary Session**

After the conclusion of the paper presentation by the presenters, the last plenary session was held. The topic was: **“Human Resource Requirements: the Industry perspective /HGST’s Integrated University Program (IUP)”**. This topic was discussed by Ms. Josephine Soñosa, Human Resource Officer, HGST, Western Digital Company.

Ms. Soñosa discussed the standard requirements in her company’s recruitment process. The company is accepting only the brightest and the most talented applicants who can fit into their highly sophisticated Company’s System.

She informed the group of her company’s on-the-job-training for faculty and students. These faculty and students on-the-training are coming from the partner-institution of the HGST.

These partner institutions received package of equipment from the HGST Company visit is also allowed under their requirements.

She announced that HGST (formerly Hitachi Global Storage Technologies and now Western Digital Company) has the Industries fastest and most advanced enterprise class, multi cell SAASSSD family the ultrastar SSDSOO MH, ultrastar SSD800 MM and ultrastar SSD1000 MR.

Her presentation was followed by an open forum presided over by Dr. Cecilio S. Baga.

## **Closing Program**

The closing program followed immediately after at 10:30 in the morning after the presentation of the last plenary speaker.

The **11<sup>th</sup> PACUIT National Conference was officially closed** by Dr. Bonifacio S. Villanueva, President of PACIT for Visayas after delivering his closing message.

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