Philippine Physics Journal

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Philippine Physics Journal, Vol. 38 (2016)

Abstract

Ultrasound imaging, or ultrasonography, is consistently one of the most commonly utilized diagnostic procedures. This is despite the introduction of many other alternative diagnostic methods. The reasons include ultrasound being non-ionizing (unlike X-rays and CT scans), non-invasive (unlike tissue biopsies), less expensive and more commonly available (unlike MRI and genetic tests). In addition, new ultrasound technologies have also made ultrasonography more reliable and agile, thus offering more and more diagnostic capabilities. One of these new technologies is the so-called “ultrasound elastography”.

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Abstract

Nafion thin films were deposited on silicon substrate using the spin coating technique. The dependence of the film thickness on the concentration of Nafion and the spin coating angular speed was investigated by scanning electron microscopy (SEM). Thickness measurement results show that the thickness of the films decreases with increasing angular speed and increases with increasing Nafion concentration.

38.04 **Predictors of Attitude Towards Physics**

PPJ, Vol. 38 (2016), pp. 14-20

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Abstract

The study aims to: (a) identify personality of students, and teacher's characteristics and student's attitude toward physics; (b) determine correlations between student's attitude toward physics on one hand and personality of students, and teacher's characteristic on the other hand, (c) determine if personality of students and teacher's characteristics are predictors of attitude towards physics.

College physics students at the College of Sciences, Palawan State University were the respondents of the study. Questionnaires were used to gather data. Frequency, percentage, t-test, Pearson correlation coefficients, and stepwise multiple regressions were used for statistical treatment.

The study revealed that: (a) attitude towards physics positively and are significantly correlated with teacher's characteristics and personality of students; (b) personality of students and teacher's characteristics are predictors of student attitude toward physics.

38.05 **Fabrication of YSZ Thin Films for Fuel Cell Applications**

PPJ, Vol. 38 (2016), pp. 21-30

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Abstract

YSZ thin films were fabricated using the spin-coating method. The effects of varying the YSZ weight percentage composition to solvent ratio concentration were determined by Raman spectroscopy., scanning electron microscopy (SEM) and X-ray diffraction (XRD) were utilized to analyze the morphology of the films. SEM results showed that the fabricated films are porous. The porosity of the film decreased while the thickness of the film increased as the concentration of YSZ was increased. X-ray diffraction and Raman patterns show that the crystal structure of the fabricated YSZ thin films is cubic fluorite which indicates that the films are stable.

38.06 **Analogy-Enhanced Instruction: Its Effect to Physics Achievement and Physics Attitude of Fourth Year Students**

PPJ, Vol. 38 (2016), pp. 31-40

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Abstract

This study investigated the effectiveness of analogy-enhanced instruction to the Physics Achievement and Attitudes of Fourth Year students'.

The researcher used a pretest-posttest true experimental method aside from that the researcher made used of a matched-pair design to group traditional exposed group and the analogy-enhanced group which are Groups I and II respectively. The experiment used a purposive pair of 32 pairs or 64 high school students enrolled at Muntinlupa National HS Annex.

Findings showed that there is significant difference between the mean gained scores of the students in the Control Group (Group I) using the Traditional Instruction and the Experimental Group(Group II) using the Analogy-Enhanced Instruction in the Achievement Test for Physics. The

Experimental Group exhibited better performance than the Control Group which affirmed the effectiveness of analogy-enhanced instruction in increasing the performance of the students.

There is no significant difference between the mean gained scores of the students in the Control Group (Group I) using the Traditional Instruction and the Experimental Group (Group II) using the Analogy-Enhanced Instruction in the Physics Attitude. It showed that the used of analogy-enhanced instruction and traditional instruction showed no improvement of attitudes of the senior students.

38.07 **An Intersection of Algebra, Calculus and Graphs: The Distance Travelled by a Uniformly Accelerated Object (One Dimension)**

PPJ, Vol. 38 (2016), pp. 41-44

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Abstract

This paper shows how the equation s = v i t + 1⁄2 a t 2 for uniformly accelerated motion in one dimension can be obtained using algebra, a graphical method, and calculus.

38.08 **Automated Water Level Monitoring and Warning System With SMS Capabilities**

PPJ, Vol. 38 (2016), pp. 45-55

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Abstract

An automated water level monitoring and warning system with SMS capabilities was constructed. Suitable set up for the water level sensor was determined to assure reliability. The three probes system was found to be most reliable among the improvised sensors tested. The device was built using Arduino Uno Microcontroller device incorporating Global System for Mobile Communication (GSM) capabilities. The device was able to do the following functions: (a) monitor the sudden increase or decrease of water

level, (b) provide warning at specified water levels using led light and buzzer, (c) send short messaging service (SMS) at specified water levels. SMS are sent immediately when water level is at a critical level. Only a 9-second delay was recorded from when the change in the water level was detected by the sensor and when the SMS was received. The results showed that the device is 100% reliable according to the different tests that were conducted or performed to evaluate the reliability and functionality of the device. It consistently texted the alert value for a specified water level and gave warnings using LED light and buzzer for the specified time assigned. This device may be helpful in planning and evacuation in case of a sudden and dangerous rise of water.

38.09 **Specific Heat of Sea Sand Samples From Siquijor, Philippines**

PPJ, Vol. 38 (2016), pp. 56-64

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Abstract

Using recycled and readily available inexpensive local materials, a calorimeter is designed and constructed. After determining its accuracy and reliability, the calorimeter is then used to measure the specific heat of sea sand samples collected from each of the six towns of Siquijor employing the method of mixture. Experimental results yield an average value of 0.22 cal/g which agrees very well with values obtained from sea sand samples collected from other provinces.

38.10 **Improvises Loop the Loop Track: Demonstration and Investigation of the Minimum Launching Heights**

PPJ, Vol. 38 (2016), pp. 65-68

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Abstract

This paper presents an improvised apparatus to demonstrate the transformation of potential energy into kinetic energy and investigate the minimum launching of the loop the loop track. Findings show that the improvised Loop the Loop Track apparatus is effective in explaining the principle of conservation of energy and in verifying that the minimum height h = 27/10 R. The theoretical and experimental values of h are close to each other. The minimum launching height is dependent on the radius of

loop and independent on the ball radius. The improvised apparatus can be used by teachers to visualize and demonstrate the principle of conservation of energy.

38.11 **Misconceptions on Force and Gravity Among Engineering Students of Mariano Marcos State University**

PPJ, Vol. 38 (2016), pp. 69-81

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Abstract

This paper presents the study on misconceptions on force and gravity among engineering students of Mariano Marcos State University. The descriptive-comparative type of research was employed in the study. Misconceptions on force and gravity were gathered using the questionnaire used by Pablico (2010) which was adapted from Asia-Pacific Physics Teachers and Educators Association (APPTEA) research published in 1989. Findings reveal that students do not have a clear understanding on the concepts of force and gravity. Along force and motion, they believed that the direction of force is the same with the direction of motion. On gravity, they believed that there is no gravity outside the earth. And on the equal blocks, they believed that the block will move to equal distances. The difference in the number of misconceptions on force and gravity between and among the major courses in engineering is not statistically significant. The researchers recommend that the results of this study should be used as a basis for the teachers and administrators in improving the physics curriculum, that teachers should think of teaching strategies that could address the students' misconception, and that teachers should find ways of identifying misconceptions of the students and use as guide in the teaching process.

38.12 **Determining the Speed of Sound in Dry Air Through Lissajous Figure Analysis**

PPJ, Vol. 38 (2016), pp. 82-90

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Abstract

In this paper, we present an atypical technique of the measurement of the speed of sound in air. The measurement involved an analysis of the Lissajous figures formed on an oscilloscope. Lissajous figures, a family of curves, are obtained from two sine waves at right angle with each other and with relative phase difference. A sine wave from a function generator was formed on the scope and the same sine wave was picked up by a movable microphone. The speed of sound obtained from this technique was 346 ± 3 m/s, just within the value of the practical dry air formula at 348 ± 10 m/s, and within the range of theoretical values of speeds 346.3 m/s to 349.1 m/s at temperatures of 25 o C to 30 o C, respectively.

38.13 **Inexpensive Free Fall Apparatus**

PPJ, Vol. 38 (2016), pp. 91-97

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Abstract

The study on inexpensive experiments and demonstrations in mechanics aimed to generate a concrete visual model that will help explain the principles of mechanics. Specifically, this study aimed to design and construct a Free Fall Apparatus out of inexpensive locally-available materials. An experiment which demonstrated quantitatively the principles in free falling object is also discussed.

38.14 **Constructivism and Outcomes Based Physics Education**

PPJ, Vol. 38 (2016), pp. 98-102

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38.15 **Characterization of the Effect of Urbanization of Metro Manila on Rainfall**

PPJ, Vol. 38 (2016), pp. 103-114

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Abstract

The effect of urbanization of Metro Manila to the amount of rainfall of selected urban and rural areas was investigated using the Weather Research and Forecasting Version 3.4.1 (WRFV3.4.1) model. The NCEP FNL grib 1 data of 2000 to 2010 were used as input in the model for meteorological data. The Mann-Kendall trend test (M-K test) was ncorporated to verify the significance of the trends while the Sen's slope estimator quantified the measured trends. Results showed that, Metro Manila recorded 11 year higher average values of rainfall during the summer period (8% to 64%) rainy period (15% to 305%) and transition period (8% to 232%) when compared with selected areas from 25 km up to 100km from Manila. It was also found that rainfall of nearby areas (25km) are affected by urbanization of Metro Manila. The p-values for rainfall in each of the sites selected in the study are greater than the set significant value of 0.05.

38.15 **Measurement of Surface Tensions of Liquids Using an Optico-Capillary Tensiometer**

PPJ, Vol. 38 (2016), pp. 115-122

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Abstract

The teaching of Physics of liquids can be more interesting and understandable using inexpensive experiments and demonstrations. A locally-made Optico-Capillary Tensiometer Apparatus (measurement of surface tension) was designed, constructed, and tested for accuracy and reliability. It was then used to measure the surface tensions of some commonly available liquids.

Philippine Physics Journal, Vol. 37 (2015)

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Abstract

Practical Physics experiment can make a positive impact on students' learning of Physics concepts and likewise developed students' scientific knowledge. This paper describes an experiment, body measurement, intended for non-Physics majors, but can be more relevant for the health science students. The detailed procedure of the experiment is largely based on a few medical literatures, on the authors' experience while performing the experiment, and feedback from the group of Pharmacy and Nursing students, the first group to pilot the experiment. Students' and teachers' opinions regarding the experiment suggest that students' were greatly motivated and their interest was drawn. On a greater part, the interest was due to the knowledge of their own body measurements, and also their Body Mass Index (BMI) and waist-to-hip ration (WHR), two diagnostic tools to determine healthy weight.

37.04 **Synthesis and Characterization of CU-O Complexes Thin Films Prepared Via Chemical Solution Deposition Method**

PPJ, Vol. 37 (2015), pp. 26-37

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Abstract

The Cu-O complexes thin films synthesized via chemical solution deposition were analyzed by FTIR, UV-VIS and SEM-EDS. The Thin film samples deposited in microscope glass slide were composed mostly of C, Si, and O with trace amounts of Cu. There were more lumps as the NaOH temperature increased during the deposition procedure. UV-VIS results showed that all the samples have very low absorbance in the visible region of spectrum. In addition, absorbance increases towards the infrared region of spectrum. In general the samples showed very low reflectance at visible spectrum with a maximum value of 20.05%. In addition, Cu-O thin film complexes were deposited due to the presence of Cu in all the samples. Finally, the samples deposited at higher NaOH temperatures (60º and 70ºC) showed similar spectra while the rest of the samples were different.

37.05 **Investigating the Effect of Urbanization on Heat Flux of Selected**

Urban and Rural Areas Using WRFV3.4.1.

PPJ, Vol. 37 (2015), pp. 38-45

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Abstract

Urbanization is a direct result of physical growth of urban areas due to an increase of its population. Globally, urban population exceed the rural population and it is estimated that in 2050, 70% of the world population will live in urban areas with more than half of them concentrated in Asia. The higher demands of housing in urban areas bring changes in land use where vegetation areas are transformed to high rise buildings and roads. High rise buildings can disturb the energy balance particularly, the upward heat flux.

This research investigated the effect of urbanization of Metro Manila on the amount of heat flux of selected urban and rural areas using the Weather Research and Forecasting Version 3.4.1 (WRFV3.4.1) model. The NCEP FNL grib 1 data of 2000 to 2010 were used as input in the model for meteorological data.

Results showed that, on the average, the heat flux of Metro Manila is about $1.5x10^8$ J/m2 higher than in the selected areas. In this period, the data obtained by the other sites were closer. The heat flux of nearby rural areas are not affected by the high heat flux of Metro Manila. It was also observed that land use index (LU) and population affected the value of heat flux.

37.06 **Optimization of Gamma Rejection and Sensitivity of a Proton Recoil Scintillator Neutron Dosimeter**

PPJ, Vol. 37 (2015), pp. 46-50

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Abstract

Active neutron dosimeters are used in sites where neutron radiation is present. Generally, they are used in the handling/operation of neutron sources and in neutron generating facilities. Commonly used active neutron dosimeters are composed of a slow neutron detector surrounded by moderators. These are usually unwieldy because of the size and weight of the moderators, and are disadvantageous for high energy neutrons with energies above 10MeV. The proton recoil scintillator is an alternative which

is a lightweight neutron probe with an extended energy range. A Ludlum Model 42-41L “PRESCILA” (Proton Recoil Scintillator – Los Alamos) Neutron Probe was tested using a Cf-252 neutron source and Co-60, and Cs-137 gamma sources at 500V and 700V for gamma discrimination settings, and was tested at 500V for sensitivity or count rate per dose rate. The PRESCILA demonstrated its capability in gamma discrimination and demonstrated a high sensitivity.

37.07 **Effects Varying the Location of Information Carrier and Fractal Dimension in the Moore-Neighbourhood Diffusion in a Diffusion-Limited Aggregation Cluster**

PPJ, Vol. 37 (2015), pp. 51-57

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Abstract

The effects of varying the fractal dimension in DiffusionLimited Aggregation (DLA) clusters of different location of information carrier (at the center, branch, and from outside the cluster) were analysed. When the information carrier was introduced at the center, the total time of diffusion did not have significant difference with varying the fractal dimensions. Also the rate of diffusion was almost the same. Fluctuation in the total time of information diffusion with increasing fractal dimension occurred when the information carrier was introduced at the branch and from outside the cluster.

37.08 **Laboratory Experiment: Density and Archimedes’ Principle**

PPJ, Vol. 37 (2015), pp. 58-59

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Abstract

The mass density of an object may be determined experimentally by weighing it in air, submerging it totally in a liquid, using equations derived from Newton’s 1st Law and Archimedes’ principle. In the process, the density of an unknown liquid can also be determined.

37.09 **Laboratory Experiment: Forces and Archimedes' Principle**

PPJ, Vol. 37 (2015), pp. 60-61

Raymund S. Vizcarra, CE, MSc, PhD
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Abstract

The forces exerted on a suspended object that is totally submerged in a liquid may be analyzed using equations involving Newton's first law and Archimedes' principle.

37.10 **Concentration Analysis and Item Response Theory Model of the Force Concept Inventory and Mechanics Baseline Test Responses of the Students of the University of Northern Philippines**

PPJ, Vol. 37 (2015), pp. 62-76

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Abstract

In this study, the Force Concept Inventory (FCI) and the Mechanics Baseline Test (MBT) were administered to the engineering students of the University of Northern Philippines. The students' responses were subjected to concentration analysis and item response theory model to extract information regarding their mental models of basic mechanics concepts and to determine their proficiency as compared to other student populations who also took up the standardized tests.

37.11 **Radioactive Decay Chain**

PPJ, Vol. 37 (2015), pp. 77-84

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Abstract

The article presents a simulation of a radioactive series that can be performed in nuclear physics classes without the hassle of securing licenses and radioisotopes, the danger of radioactive contamination, and the necessity of purchasing expensive equipment. It involves, however, quantitative calculation and graphical solution. Results of student

experiments agree closely with theoretical values.

37.12 **Implementing an Inverted Classroom Model in Fluid Mechanics for Engineering Students**

PPJ, Vol. 37 (2015), pp. 85-97

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Abstract

Flipping the classroom allows students to learn concepts outside of the classroom and apply what they learn in the classroom, working with other students and getting immediate feedback from the instructor. The purpose of this study was to determine the effect of flip- flop teaching in the performance of engineering students in introductory physics particularly in fluid mechanics. The study employed descriptive method to investigate and describe the performance of engineering students in fluid mechanics when grouped according to gender and types of instruction. Three physics sections consisting of 125 sophomore engineering students at the Batangas State University during the second semester of the SY 2013-2014 were handled by the researcher and used as participants of the study. It was found out that the variation in the performances of male and female students in the conceptual questions, in the problem solving questions, and overall performance in fluid mechanics are not significantly different. Male and female students have an overall satisfactory performance in fluid mechanics. The study also revealed that the variation in the performances of the students in the conceptual questions, in the problem solving questions, and overall performance in fluid mechanics when grouped according to the types of instruction are not significantly different. Engineering students taught in a traditional physics classroom, in an inverted physics classroom, and in an enhanced-inverted physics classroom are more likely to have similar performances in fluid mechanics.

37.13 **The RDJ Robot: A Prototype Robot for Package Sorting and Moving**

PPJ, Vol. 37 (2015), pp. 98-108

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Abstract

Robots have been crucial to human life activities such as in industries. They are employed to expedite processes, perform perilous activities that are detrimental to humans, and help reduce human efforts. One particular application of robots is in a warehouse where they are used to move and sort boxes and packages. Thus, the primary focus of the study involved the design, construction, and programming a prototype robot capable of sorting and moving packages to designated areas.

The Lego Mindstorms NXT 2.0 Kit and NXC language were the foremost materials used in the construction and programming of the prototype. The robot has a microprocessor, servo motors, and three sensors: ultrasonic, touch, color. The prototype was capable of (1) recognizing package types through color identification, (2) gripping, lifting, and carrying packages, (3) locating correct bins and (4) placing packages into proper bins.

The robot was also programmed to manage errors; inclusive of which were: (1) halting when an obstruction is detected, (2) determining if the package is not grabbed or has fallen, (3) detecting if no package to be moved and sorted, (4) responding to nonexistence of corresponding bins of the packages, (5) responding to failure of identifying package type, lastly (6) returning to specified path if lost or running in reverse direction.

Various impediments were encountered in the course of the research which include (1) dealing with the light sensitivity of the color sensor, (2) perfecting the algorithm used by the prototype to follow the specified path, and (3) dealing with its power consumption. Extensive experimentation and testing were done to deal with the aforementioned problems and improve performance and robustness of the robot.

The outcome of the study resulted into a successful design, construction, and program of a prototype robot capable of package sorting and moving. Enhancement in the capabilities and augmentation of error-handling were recommended to further improve its robustness.

37.14 **Assessment of Physics Understanding**

PPJ, Vol. 37 (2015), pp. 109-125

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Abstract

In this paper, formative assessment is viewed in the light of the “learning- understanding” link. It starts with the idea of “learning with understanding” and proceeds to point out important considerations in

assessing understanding. The essence of formative assessment is then discussed and bolstered by the two-tier complementary discussion on both formative assessment techniques and teaching strategies before points in conclusion are posited.

37.15 **Output Power Prediction of Solar Energy Kit Using Multiple Linear Regression ANalysis**

PPJ, Vol. 37 (2015), pp. 126-133

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Abstract

Solar Energy is widely taught in most science students especially in physics. A Solar Energy Kit (SEK) had been introduced to demonstrate basic solar energy concepts in the classroom setting. Participating Grade 8 students were engaged to hands-on activities utilizing the SEK at Bukidnon National High School – Annex Aglayan, Malaybalay City, Bukidnon. Their actual data sets were treated with Pearson correlation and Multiple Linear Regression Analysis (MLRA) to determine the output power equation of SEK in terms of variables like voltage, current, illumination, surface temperature and time duration. Results revealed that the strongest predictors are illumination, voltage and current variables.

37.16 **Neutron Flux and Dose Leakage Measurement Outside the Neutron Howitzer with Pluntonium-Beryllium as Neutron Source**

PPJ, Vol. 37 (2015), pp. 134-141

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Abstract

In order to minimize the radiation hazards accompanied by the continuous utilization of neutron sources, especially the Neutron Howitzer at the PNRI-Nuclear Training Center (PNRI-NTC), a series of experiments were performed to measure the amounts of radiation dose leakage from the

source. 6 detectors (3 gamma detectors and 3 neutron detectors) were placed one meter from the source to measure radiation doses. NAA had been utilized as part of the experiment making use of 10 gold foils as neutron detectors located on the surface of the Neutron Howitzer, while 10 plexiglass moderators were at the back of the irradiated foils. It was found that the leakage was dominated by fast neutrons. The findings also revealed that increasing the detectors' distances from the source, decrease the dose rates. Hence, the allowable time for exposure increase. Results of this study can be used in increasing the radiation safety of the users of the facility and for research and education.

37.17 **Conduct of the Annual Neutron School for Capacity Building in the Use and Operation of Small Neutron Sources**

PPJ, Vol. 37 (2015), pp. 142-151

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Abstract

Although nuclear technology has the potential to assist a country's economic growth, manpower development for this field is greatly hampered when there is no operating nuclear facility, as is the case for the Philippines. However, as a starting point, research studies and training programs which use isotopic neutron sources can be designed to build competence and expertise in nuclear science. In this paper, we summarize neutron studies and experiments conducted by the Applied Physics Research Section of PNRI which utilize three isotopic neutron sources: 241Am-Be, 239Pu-Be and 252Cf. Experiments described in this paper include (1) neutron moderation and shielding; (2) neutron flux and energy distribution measurements and neutron induced nuclear reactions; and (3) dosimetry in a mixed neutron/gamma radiation field. We also discuss potential research experiments which can contribute to establishing basic nuclear science knowledge for students and potential users of nuclear technology.

37.18 **Exploratory Analysis of Climate Data in Vigan City, Ilocos Sur**

PPJ, Vol. 37 (2015), pp. 152-161
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Abstract

This paper describes the climate change patterns of Vigan City, Ilocos Sur in Region I. It presents results of the Exploratory Analysis of the climate data for a period of 30 years (1983-2013). Data on average air temperature were downloaded from power.larc.nasa.com and subjected to graphical and descriptive statistical analysis.

37.19 **Inexpensive Experiment and Demonstration on Standing Waves Using Vibrating String Apparatus**

PPJ, Vol. 37 (2015), pp. 162-167
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Abstract

The is a study on waves using vibrating string aimed to generate a concrete visual model that will help explain the principle of standing waves. Thus, an inexpensive Vibrating String Apparatus was made and experimented. The results of the experiment showed acceptable results.

37.20 **Learning Physics About Forces on the Rest Object at Flat Plane and Inclined Plane Using ZOPP Card Model of Fast Feedback Method**

PPJ, Vol. 37 (2015), pp. 168-178
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Abstract

In the learning process, evaluation is needed. Evaluation aims to obtain feedback for the teachers and students. The problem is that evaluation conducted takes a long time for correction, moreover in a big class. Consequently, students' mistakes during the learning process cannot be corrected immediately. If there are students who are left behind during the learning process, then those students will always be left behind because

teachers will continue the learning activity. This research aims to introduce a quick method for correction, namely fast feedback. There are many models of fast feedback method that have been developed and in this research, the zopp card model is used. The advantage of zoop card model is that each student should answer the task and paste it on the board so that teacher can know the answers of all students, especially the incorrect ones. This research uses qualitative method. The physics topic chosen is forces on the rest object at flat plane and inclined plane. It is chosen because a lot of students thought that when an object is at rest, it means there are no forces exerted on the object. The respondents of this research are freshmen of Department of Physics Education of Satya Wacana Christian University, Indonesia. First, Lesson Plan, Tasks (Zopp Cards), and Observation Sheet were prepared. Afterward, teacher taught based on the Lesson Plan and used Zopp Cards by integrating fast feedback method zopp card model. Briefly, feedback cycle done is task-check-feedback. The time needed to perform fast feedback cycle for each level of difficulty was relatively quick, about 20 minutes. During the learning process, an observer observed the ongoing learning and filled up the observation sheet. The tasks (zopp card) and observation sheet were analyzed by qualitative description. Based on this research, fast feedback method can be implemented without additional learning time and successfully make the students who are left behind immediately correct their mistakes so that at the end of the learning activity, for a set of task, at least 70% students understand the concept.

37.21 **An Improvised Linear Track**

PPJ, Vol. 37 (2015), pp. 179-190

Angelo Benedict R. Ragunjan and Alex C. Garibay, Jr.
Mariano Marcos State University

Abstract

This experimental set-up was conducted with the primary aim of constructing an improvised linear track which demonstrates concepts on uniform accelerated motion and Newton’s second law of motion, and conservation of momentum in elastic and inelastic collisions. Made of Aluminum frame, the linear track can be used to find the acceleration of a car as it moves on its surface which was positioned to angles 10, 15, 20 and 25 degrees with the horizontal. The study also aimed to find the final velocities after the collision in elastic and inelastic collisions. A phone camera was used to capture the motions of the cars. Results show that there is no significant difference between the experimental and theoretical values for the experimental set-up using the improvised linear track. The

improvised apparatus can be used to demonstrate the concept of uniform accelerated motion. verify the Newton's second law of motion at different angles and demonstrate the behavior of bodies undergoing elastic and inelastic collisions.

37.22 **Misconceptions of High School Students in Optics**

PPJ, Vol. 37 (2015), pp. 191-198

Rhea M. Cabrera
Mariano Marcos State University,
Batac, Ilocos Norte

Abstract

This study determined the misconceptions in Optics of the students in Batac National High School. It also tried to find out the relationship between the number of misconceptions held by the students and their socio-demographic factors such as sex, occupation of parents, attitudes towards Physics and exposure to mass media. Findings showed that generally, the students had misconceptions in Optics in all the topics considered in the study. They have difficulty understanding the concepts of Reflection, Refraction, Absorption of Light, and Shadow Formation. The number of misconceptions held by the students was not influenced by their sex, occupation of parents, attitude towards physics and exposure to mass media.

37.23 **The Effect of Concept Mapping in the Physics Performance of Computer Science Students**

PPJ, Vol. 37 (2015), pp. 199-205

Grace A. Garcia
University of Northern Philippines
Vigan City, Ilocos Sur

Abstract

This study was conducted to determine the effect of concept mapping in improving the Physics performance of the Bachelor of Science in Computer Science students. The study employed the quasi-experimental research design particularly the Pretest-Posttest Non-Equivalent Group Design. Two sections were used in the experiment. One section was exposed to the use of concept mapping (experimental group) while the other section was exposed to the usual lecture demonstration method (control group). A 45-item test was used in measuring the performance of the students in Physics. This was administered to the two groups after the

discussions in Projectile Motion, Uniform Circular Motion, Friction, Newton's Laws of Motion, and Weight and Gravitation. The experiment was conducted at the College of Arts and Sciences, University of Northern Philippines for six weeks. The findings of the study revealed that the students exposed to the use of concept mapping (experimental group) performed significantly higher than the students exposed to the traditional lecture method (control group). The students in the experimental group performed/learned better than the students who were taught under the traditional-lecture method. This implies that the use of concept mapping results in meaningful learning.

37.24 **The Tri-Summer Institute Physics Program at Siquijor State College: History, Status, and Prospects**

PPJ, Vol. 37 (2015), pp. 206-213

Roel D. Taroc, MAST-Physics, Ph. D.
Professor IV
Coordinator, Physics Tri-Summer Program and
Director for Maritime Education Program
Siquijor State College
Larena, Siquijor

37.25 **Climate Change in Dumaguete City**

PPJ, Vol. 37 (2015), pp. 214-222

Daryl S. Tecon, Ma. Lisa M. Rebusa, M.S., and Gerardo C. Maxino, PhD.
Climate Studies Center
Maxino College
Bagacay, Dumaguete City3Department

Abstract

This study aimed to investigate the occurance of climate change in Dumaguete City. Thus, it collected rainfall data and constructed an electronic system for processing rainfall data. Results indicate changes in climate over three 30-year climate periods.

37.26 **36th National Physics Seminar-Workshop Convention**
27th National Physics Olympics
22th National Physics Fair
April 2-5, 2014
Maxino College

Bagacay, Dumaguete City, Negros Oriental
Theme: ”PPS @ 40 Physics and Servant Leadership”
564 Participants

37.27 **2014 Conference on Cloud Computing and Climate Studies**
Philippine Physics Society and
Maxino College
October 11, 2014
Bagacay, Dumaguete City, Negros Oriental
62 Participants

Philippine Physics Journal, Vol. 36 (2014)

36.01 **Solving Physics Problems: Textbooko vs. Laboratory**
PPJ, Vol. 36 (2014), pp. 1-10
J. P. Simafranca[1] and F. G. Glover, SJ[2]
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[2]Ateneo de Davao University
Abstract

To enhance student learning, Physics text book examples and problems are often idealizations of the real world. A dynamics problem from a popular college level Physics text was selected and laboratory apparatus was constructed to duplicate the problem. Differences between theory and practice are presented and discussed.

36.02 **Laser-Mirror-Pin Assembly (LMPA): The New Technique for Measuring Linear Thermal Expansion Coefficient**
PPJ, Vol. 36 (2014), pp. 11-19
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Abstract

The Mirror-Pin Assembly has been an excellent technique in measuring small movements of objects like bending of walls when pushed.

The heart of the set-up is the mirror-pin assembly attached to a meter stick and acts as a roller that any movement of the meter stick turns the mirror slightly and causes the deflection of the laser spot. Using the measured data: the radius of the pin, the deflection of the laser spot, and the length of the reflected beam; the displacement could be measured. In this investigation, as the researcher is now calling this as LASER-Mirror-Pin Assembly (LMPA), the same method is used to measure linear thermal expansion and compared to the highly expensive Dial Gauge. This technique has a low cost advantage over Dial Gauge since cheap materials can be used for the experimentation. The aim of this study is to investigate the precisionand accuracy of LMPA comparable to the Dial Gauge. After careful analysis, both methods yield considerably low random errors (4.11% for the LMPA and 1.84% for the Dial Gauge) and low systematics errors (8.75% for LMPA and 8.5% for the Dial Gauge). The figures indicate that both instruments give precise and accurate measurements and the slight difference of the figures indicate that LMPA has precision and accuracy comparable to the Dial Gauge.

36.03 **The Effect of Multimedia on the Physics Achievement and Attitude of Fourth Year Students**

PPJ, Vol. 36 (2014), pp. 20-31

Junar P. Santiago
Alicia National High School
Paddad, Alicia, Isabela

Abstract

This study investigated the effects of multimedia on the physics achievement and attitude of fourth year high school students. The samples which were selected using fishbowl technique from the six sections of the fourth year students of Alicia National High School were IV-Hyacinth (experimental) and IV-Sampaguita (control). The study applied the Randomized Pretest-Posttest Control Group Design. The result of the equations done to the two groups showed that they were statistically the same. The research tools employed to gather the data were the 50-item achievement test, and attitude scale. The non-use of multimedia in instruction served as control and the experimental variable was the integration of multimedia in instruction. Five hypotheses were tested at $p<0.05$ level of significance using t-test dependent and independent mean and two-way Analysis of Variance (ANOVA).

The findings revealed that the (1) pretest-posttest achievement and (2) attitude mean gain of the experimental group is significantly different. It

was also found out that the use of multimedia in instruction differs from the conventional teaching technique in (3) increasing physics achievement. Nonetheless, not significantly different (4) in developing positive attitude towards Physics. Moreover, (5) below average and low average students exposed to multimedia achieved more than their counterparts who were exposed to the conventional teaching technique. The control and experimental groups were (6) homogeneous in terms of their attitude mean gain, meaning the use of multimedia in teaching does not affect the attitude of the low average and below average students. The interaction between those exposed to different teaching techniques and ability groups does not affect their attitude. It is highly recommended that teachers must use multimedia in their instruction.

63.04 **Engineering Students' Expectations and Performance in Introductory Physics**

PPJ, Vol. 36 (2014), pp. 32-42

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Abstract

The understanding of the engineering students of what physics is about, how it is done, and their expectations as to what goes on in a physics class, can play a significant role in what they get out of their physics courses. The purpose of this study was to determine the predictors of student grades in introductory physics course. The study employed descriptive/comparative/correlational methods to investigate and describe/explain relationships of students' physics grades with their physics expectations, gender, and class sessions. The responses of the 99 engineering students at the Batangas State University on the items in the Maryland Physics Expectations (MPEX) survey instrument were compared with the responses of experts. It showed that students' overall expectation scores improved significantly between the beginning and the end of the physics course during the first semester of the SY 2010-2011. Males are more likely to have higher percentage of agreement to favorable responses prior to instruction than females. Male and female respondents were more likely to have similar physics expectations after one semester instruction. Respondents in different sessions were more likely to have similar physics expectations before and after one semester instruction. The overall post-instruction physics expectations of the students are significantly correlated

with their physics performance. Moreover, the study revealed that an expert-like belief in the concept and effort link dimensions correlate highly with good physics performance.

63.05 **Teachers' Views and Associated Mental Models on Simple DC Circuits**

PPJ, Vol. 36 (2014), pp. 43-52

Teresita D . T aganahan
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Musuan Bukidnon

Abstract

The purpose of this study was to determine secondary physics teachers' conceptions about Simple DC circuits. Data were obtained from responses in two sets of concept tests related to DC circuits by 24 physics teachers teaching in private and public high schools in Bukidnon. Results have shown that teachers have misconceptions similar to those held by students. Moreover, the study was extended to determine the usefulness of workshop activities on the same subject matter in identifying and improving the alternative views and associated mental models that the teachers hold.

36.06 **Surface and Adhesive Characteristics of Copper Thin Film Coating on Plasma-Treated PMMA**

PPJ, Vol. 36 (2014), pp. 53-62

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Abstract

In this study, the modified surface of polymethylmethacrylate (PMMA) treated with argon plasma and its adhesion effect to Cu layer is presented. The argon plasma was created in a reconfigured high vacuum system with a dc glow discharge at 1500 discharge voltage and 6mA.The argon pressure was 1.8x10 -2 mmHg. The PMMA sample was exposed to argon plasma for ten minutes. The surface modification of PMMA after plasma treatment were monitored using AFM, FTIR,XPS. The Cu films were characterized using ocean optics, optical microscope and SEM. While the adhesion effect of PMMA to Cu layer was determined using a pull-out

force sensor. AFM images show that the surface was cleaned and etched by active argon species. FTIR analysis indicated increase in the hydrocarbons groups and decrease in C=O and C-O bonds. XPS indicated increase in O/C ratio. Moreover, Cu layer on treated PMMA exhibited higher adhesion strength and less coating imperfections as compared to Cu layer on untreated PMMA. Such results may have potential applications in fabrication of high quality optical components.

36.07 **Utilization and Validation of Solar Energy Kit**

PPJ, Vol. 36 (2014), pp. 63-71

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Abstract

The study is focused on the development and validation of solar energy kit in teaching Ohm's Law in the high school physics setting. The researchers had assembled a solar energy kit and designed experimental activities that were carried out by science teachers and high school students of Bukidnon National High School - Annex Aglayan, Malaybalay City, Philippines during the second quarter of school year 2013-2014. The solar energy kit and experimental activities were evaluated by 76 student-respondents and 4 teacher-respondents using both Alberto validation sheets and Simbulan's checklist (Cronbach $\alpha = 0.87$). Data obtained from the teacher-respondents revealed that the instructional material got an overall mean of 3.90; which means that in most of the items, the teacher-respondents agreed to the same statement in 4 out of 5 situations. For student-respondents, the overall mean equivalent which was 3.56 suggests that the students strongly agree to the statements provided in the checklists. It was also found out that the solar energy kit could be assembled properly by students themselves because they could easily follow the procedures in the user's manual. It could also be further noted that the solar energy kit could be used effectively in the conduct of experiment and is indeed a good

instructional material in understanding concepts on Ohm's Law. Therefore the solar energy kit is an effective instructional material for demonstrating Ohm's Law as well as basic concepts of photovoltaic systems.

36.08 **Scaffolding Activities: An Enhancement of Students' Performance in Meteorology**

PPJ, Vol. 36 (2014), pp. 72-78

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Abstract

This quasi-experimental study sought to determine the effectiveness of scaffolding activities as enhancement of student's performance in meteorology at a teacher education institution in Iloilo City. This research utilized the pretest-posttest scores of two groups of Bachelor of Secondary Education students. The scores of the students for both groups during pair matching, pre-test, and post-test were analyzed.

The study found that the experimental group had an above average performance after the post-intervention. It was also found out that there was a significant difference between the pre-intervention and post-intervention performances of the students in both groups. There was no significant difference between the pre-intervention performances of student in both group; however, there was a significant difference between the post-intervention performances. The experimental group performed better compared to the traditional in the post-intervention performance as reflected in the mean difference. Also the mean gain for both groups is statistically significant. Finally, students as they progress doing scaffolded activities, take significant responsibility for their own learning; thus, resulting to more engaging attitude in the classroom.

36.09 **Development and Validation of Mutual Inductance Apparatus**

PPJ, Vol. 36 (2014), pp. 79-90

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Abstract

This study aimed to design and evaluate an improvised laboratory apparatus used for teaching the least learned competency in Physics. In this case, the researchers decided to prepare a material in the topic electricity and magnetism, specifically in the lesson of mutual inductance which is very observable in a transformer. Research and development was the design used in this study. The researchers used the experimental value of the gathered data from the activities performed using the apparatus to be able to measure the development of the material being produced. Percent error was also computed, which was considered as evidence for the development spect of the study. For the validity of material, the researchers used the checklist evaluation form for instruction material by Simbulan (for teachers) and by Alberto (for students). For the development of the material, the computed mean were close to the standard value. Percent errors computed were also at its minimal value. For the validity of the material, the students strongly agree that the feature of the material was provided adequately, thus students confirm the validity of the material being produced. The teacher responded mostly much, meaning teachers agree to the four statements out of five and there were only few items where some answered just enough, meaning teachers agree to the three statements out of five to the criteria that was used in the checklist. This implies that the validity of the material is being established. Therefore, the mutual inductance apparatus is a reliable and suitable learning device for the physics classroom.

36.10 **Conceptual and Inquiry-Based Approaches in Teaching Introductory Physics**

PPJ, Vol. 36 (2014), pp. 91-96

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Abstract

This paper focuses on how deep understanding can be achieved through the use of concepts and real-world experiences in teaching Introductory Physics. Most students enter Physics with a preconceived idea that it is difficult and complicated as they consider it a subject full of word problems. Furthermore, due to lack of materials and proper training, teachers are often tempted to treat the subject as one more application of

Mathematics, thus making it appear more complicated and abstract to most students. However, this misses the fact that Physics is a Science subject and very important in guiding students address their misconceptions about the world around them. Making students inquire and experience make the learning deeper and permanent. The use of meaningful associations and suggestions also help. The integration of history of science in the lesson also contributes in the holistic learning of students. This paper will present some best practices in Bacolod Tay Tung High School that use conceptual and inquiry-based approach.

36.11 **Thermal Flux Measurements with Activation Foils in a Neutron Howitzer**

PPJ, Vol. 36 (2014), pp. 97-103

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Abstract

Initial characterization of a neutron source in a water moderated howitzer is presented. The alpha-emitting radioisotope in the source was positively identified as 239 Pu via gamma spectrometry. Relative thermal neutron flux was measured from radioactivity induced in irradiated indium foils located at several distances from the source. Maximum thermal neutron flux of 2.53×10 1 n/s-cm 2 is obtained at 2 cm distance from the source. Neutron moderation by water is demonstrated as well as the inherent radiation safety feature of the setup. Further steps in characterizing the source were identified which will provide opportunities for more research study and potential utilization of the howitzer for training and education in nuclear science.

36.12 **Performance of the Improvised Logic Gate Circuit Trainer in a Fourth Year High School Classroom**

PPJ, Vol. 36 (2014), pp. 104-108

Marie Khul C. Langub, MAT
Southern Leyte State University
Sogod, Southern Leyte

36.13 **Predictive Value of UPCAT Math and Science Scores, University Predicted Grade, and IQ to Fundamental Physics and Math Performance of BS Physics Students**

PPJ, Vol. 36 (2014), pp. 109-117

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Abstract

This study was conducted to determine which of the following variables: UPCAT Math Subtest score, UPCAT Science Subtest score, University Predicted Grade (UPG), and IQ, correlates to the average grades of BS Physics students from the University of the Philippines Baguio (UPB) in their fundamental math, fundamental physics, and the combined average of their fundamental math and physics. Regression analysis was used together with discriminant analysis to determine the various predictors of academic performance. Based on the sig. values calculated in the regression analysis, it was determined that the UPG was the best predictor of the fundamental physics average grade. UPCAT Math Subtest score was the best predictor of the fundamental math average grade as well as the combined fundamental physics and math average grades. The UPCAT Science Subtest score and the IQ were found to be non-factors in predicting a BS Physics student's performance in the said subjects. Based on the most appropriate regression equation, a recommended UPCAT Math cutoff score was identified as a plausible additional criterion for prospective enrollees of UPB's BS Physics program.

36.14 **Neutron Flux Measurements Inside the Americium-Beryllium Neutron Calibrator Source**

PPJ, Vol. 36 (2014), pp. 118-126

Jester N. Itliong[1], Williard B. Solmeron[1], Kristine Joy G. Ortiz[1],
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Abstract

In order to possibly increase the utilization of Am-Be neutron calibrator source in PNRI, especially in the field of elemental analysis, a series of experiments were performed to determine the neutron flux

distributions inside the facility employing neutron activation method. The Am-Be neutron calibrator source was characterized and described. Bare and cadmium-covered gold foils which served as neutron detectors were placed in specified locations in the 7-slab conical-shaped pre-fabricated HDPE moderator. The highest neutron flux measured in both bare and cadmium-covered gold foils was determined to be at the second location of the pre-fabricated moderator, which is 2.54 cm from the source. On the other hand, the seventh location or about ~15.3 cm from the source was found to be the most suitable sample location in performing NAA provided that the samples are irradiated at longer times. Results of this study can be used in the optimization of neutron activation parameters for NAA and increased utilization of the facility for research and education.

36.15 **Tertiary Introductory Physics as some Educators See It**
PPJ, Vol. 36 (2014), pp. 127-131
Raymund S. Vizcarra, CE, MSc, PhD
Physics Department, Ateneo de Davao University

36.16 **Exploratory Analysis of the Factor Structure of themselves "Sources of Teaching Efficacy in Physics Scale (STEPS)"**
PPJ, Vol. 36 (2014), pp. 132-141
Michelle Nena Curada, MATCP and John Stephen Curada, PhD
Abstract

The present study determines the factors measured by the research instrument intended to determine sources of efficacy in teaching Physics. The responses in the 15-item scale from faculty of private and public HEIs in Davao City handling Introductory College Physics (N=75) comprised the research data. Factor analysis using varimax rotation reveals a four-factor solution. The four factors which are identified as (1) influence of models and training, (2) sense of competence and fulfilment, (3) feedback, and (4) actual pedagogical experiences resemble the four sources of efficacy information identified by Bandura. Results of the reliability analysis using Cronbach's alpha reveal that the subscales corresponding to the four factors have moderate to high reliability. Recommendations and implications for future research are discussed.

36.17 **Rainfall and Water Needs: An Illustrative Study of a Small Community**
PPJ, Vol. 36 (2014), pp. 142-148

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[2]Climate Studies Center, Maxino College, Dumaguete City

Abstract

This study investigates the feasibility of rain harvesting to augment the water resources of a small rural community. The water consumption and rainfall pattern of Oslob, Cebu were determined. The rain collection efficiencies of galvanized iron (GI) and nipa roofings were measured. The size of the needed water tank was then calculated. Finally, the study assessed the potential of rain harvesting to help meet the water needs of the community.

36.18 **The Role of Learning Identity on the Physics Performance of Engineering Students**

PPJ, Vol. 36 (2014), pp. 149-159

Erwin F. Cadorna, Ph.D., Edelyn Alicar-Cadorna, Ph.D.,and
Paul Rommel R. Valencia, CE
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Vigan City

Abstract

This study determined the level of learning identity of the students in a Physics classroom environment and their level of Physics performance. The descriptive research design was employed in the study. The respondents of the study are the 84 engineering students enrolled in Physics I during the First Semester of School Year 2013-2014.

Findings of the study show that the students had a high physics learning identity. They have the willingness and ability to interact in the Physics classroom as a result of their belief that they are able to engage actively with other students. However, they were not very confident about themselves and what they can do like communicating Physics to others, solving physics problems and being successful in their current Physics and future Physics and Math classes. Meanwhile, difference in the physics learning identity of the male and female students is not statistically significant. The students had a satisfactory performance in Physics. The male and female students also performed equally well in Physics. Physics learning identity contributed significantly to the Physics performance of the students. Valuing group work for learning Physics, students' responsibility in learning and self-efficacy for academic success significantly predict Physics performance.

36.19 **Information and Communication Technology (ICT) use in Teaching Physics**

PPJ, Vol. 36 (2014), pp. 160-170

Edelyn Alicar-Cadorna, Ph.D. and Erwin F. Cadorna, Ph.D.
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Vigan City

Abstract

Utilizing the descriptive research design, this study determined the ICT usage in teaching Physics at the secondary level. The respondents of the study are the 45 Physics teachers in 17 secondary schools in three Divisions of Ilocos Sur.

Findings show that the most common hardware owned by the Physics teachers is computer but had limited access to internet. Meanwhile, the most common software own by the teachers are mobile devices like cell phone and communication software. The general office suites most commonly available to the teachers are word processing and spreadsheet. The physics teachers are not much confident in the use of ICT, both on its general and instructional use. Moreover, the teachers do not maximize the use of ICT in teaching Physics. Considering what ICT can contribute to the teaching learning process, these are only used at an average level. It is in the preparation of lesson and teaching materials, motivation, evaluation of learning outcomes and summarizing lessons where ICT were most ommonly integrated. The most common ICT application tools used were the Electronic Spreadsheets, Video/LCD Projector, and Word Processing, CD/ROM, VD-VCD.

The most common problems experienced by the teachers in the use of ICT in teaching Physics are lack of digital resources, lack of ICT pedagogy skills and time. Furthermore, the best predictors in the use of ICT are confidence in the general use of ICT and possession of social networking account/s.

36.20 **DC Resistive Electric Circuits: A Study of Students' Alternative Conceptions**

PPJ, Vol. 36 (2014), pp. 171-180

Erwin F. Cadorna, Ph.D. and Edelyn Alicar-Cadorna, Ph.D.
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Abstract

This paper reports a study of the alternative conceptions held by

college students on direct current (DC) resistive electric circuits. The descriptive exploratory type of research was employed in the study. The students completed a written test which probed their understanding of the concepts of DC resistive electric circuits.

Findings reveal that the students do not have a clear understanding of the concepts of DC resistive electric circuits. They hold several misconceptions. These are related to the students' understanding of the properties of the battery and what it supplies to the current. The students were missing some knowledge of where the contacts are located on a light bulb. They lack understanding that a resistor has an inherent resistance based on its shape and the material from which it is made. However, the students were able to translate from a realistic representation of a circuit to the corresponding schematic diagram and vice versa. Meanwhile, there are differences associated with sex in terms of the students' performance and number of misconceptions held. Generally, males utperformed the females hile females tended to hold more misconceptions.

36.21 **Temperature Anomaly Estimates in Selected Cities in the Island of Luzon**

PPJ, Vol. 36 (2014), pp. 181-184

Mario P. Obrero and Mariquit M. Obrero
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Abstract

This paper presents the temperature anomaly estimates of selected cities in the island of Luzon based on NASA's daily records of air temperatures from 1983 to 2013. Indicating the extent of climate change in each city, the anomalies were plotted against year to establish trends. Increasing anomalies are evident in the cities of Vigan, Baguio and Manila while a decreasing trend characterizes Tuguegarao City. Findings may be disseminated to the people and may serve as basis for determining the appropriate actions to control global climate change.

36.22 **Learning Style, Atittude and Force Concept Inventory (FCI) Score of the Bachelor Science in Inductrial Education (BSIE) Students of the University of Northern Philippines**

PPJ, Vol. 36 (2014), pp. 185-193

Baby Sophia S. Alaibilla, Joey-Nell T. Marzan, Mark Christopher Molina
University of Northern Philippines

Abstract

This study aimed to determine the learning style, attitude in physics and level of Force Concept Inventory (FCI) score of the Bachelor of Science in Industrial Education (BSIE) students of the University of Northern Philippines-College of Teacher Education (UNP-CTE). The students' level of achievement was determined by administering the FCI test authored by Hestenes, D. and Holloun, I. The students' attitude towards physics was determined through the use of an attitudinaire used by Abalos (2013) while the students learning style was determined by administering a questionnaire used by Ablang (2013). It was found out that the respondents have a very low level of score in Force Concept Inventory. Their responses on the attitudinaire revealed that they have negative attitude towards physics while their responses on the questionnaire on learning style revealed that they are not certain on their preference of a kind of learning tyle. The FCI scores were regressed to the Learning Styles and Attitudes towards Physics. The combination of these factors did not contribute significantly to the students' FCI scores. However, taking the variables singly, the FCI scores of the students was significantly influenced by the learning style of the students.

36.23 **Interest, Out-of-School Experiences and Performance in Physics of the Fourth Year High School Students of Mariano Marcos State University**

PPJ, Vol. 36 (2014), pp. 194-201

Angelo Benedict R. Ragunjan
Mariano Marcos State University

Abstract

This study determined the interest, out-of-school experiences and performance in Physics of the 135 fourth year high school students of Mariano Marcos State University during the school year 2013-2014. It also looked into the relationship of the interest, out-of-school experiences and the level of achievement in Physics of the students.

Findings showed that generally, the student-respondents of Mariano Marcos State University have a high level of interest and out-of-school experiences in Physics. The students also have a high level of interest in Force and Motion, Heat and Temperature, Wave, Light and Optics, Electricity and Magnetism, and Relativity, Radioactivity and Astronomy. Students also obtained satisfactory level in their Physics performance particularly along Mechanics, Thermodynamics, Wave Motion and Electromagnetism and very satisfactory performance in Modern Physics. The students also obtained very satisfactory level of performance in

Remembering and satisfactory level of performance in Understanding, Applying and Analyzing. The students' interest and out-of-school experiences significantly influenced their performance in Physics.

36.24 **Towards the Advancement of Tertiary Introductory Physics Teachers: Hopes, Dreams, ans Passions**
PPJ, Vol. 36 (2014), pp. 202-209
Raymund S. Vizcarra, CE, MSc, PhD
Physics Department, Ateneo de Davao University

36.25 **Measurement of Some Physical Properties of Hot Spring Water Samples from Valencia, Negros Oriental**
PPJ, Vol. 36 (2014), pp. 210-217
Jessa May P. Dales
Physics Department, Maxino College
Dumaguete City
Absract
A double-walled calorimeter, a conductance meter, and a coefficient of volume expansion apparatus were designed, constructed, and tested for accuracy and reliability. Water samples from hot springs in Valencia, Negros Oriental were then collected and the following properties were experimentally determined: density, surface tension, specific heat, electrical conductivity, index of refraction, boiling point, and coefficient of volume expansion.

Philippine Physics Journal, Vol. 35 (2013)

35.01 **Constructing A Digital Planetarium in Your Classroom**
PPJ, Vol. 35 (2013), pp. 1-6
Engr. Philip P. Carpina
Bacolod Tay Tung High School
Bacolod City

35.02 **Atomic Hydrogen Adsorption and Desorption On/From Graphite**

Via the Armchair Edge: A Quantum Dynamics Study

PPJ, Vol. 35 (2013), pp. 7-13

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Abstract

This study investigates the quantum mechanical behavior of the adsorption and desorption of hydrogen atom on/from graphitevia the armchair edge. The adsorption and desorption probabilities of H are calculated using the coupled channel method via the Local Reflection (LORE) matrix and are plottedagainst the initial translational energy of H. The adsorption probability plot shows a non-activated reaction indicating that hydrogen is easily adsorbed on the surfaceof the graphite sheets. On the other hand, the desorption probability plot shows that desorption of H from the graphic sheets is an activated process with a barrier height of 4.19 eV. Due to this high barrier, desorption of the adsorbed H atom from the surface of the graphite sheets at operating temperatures (300-1500 K) of conventional fuel cells is unlikely to occur.

35.03 **Student-Student Verbal Interaction and Physics Performance in a Cooperative Learning Environment**

PPJ, Vol. 35 (2013), pp. 14-23

Edelyn Alicar-Cadorna, Ph.D and Erwin F. Cadorna, Ph.D

Abstract

Employing the exploratory and correlational research designs, the study determined the verbal interactions displayed by students working cooperatively in a Physics classroom environment. The study also investigated on the contribution of these verbal interactions on the Physics performance of the students.

Findings showed that the students in a cooperative learning environment have varied verbal interaction. They give and receive solicited as well as unsolicited help. They give and receive unsolicited help more than solicited help. In addition, students in a cooperative learning environment have a

high Physics performance. Meanwhile,there is significant influence of student-student verbal interaction on student's performance in Physics. N verbal interaction with group members contributes to an enhanced learning as a reflected by high physics performance.

35.04 **Mathematics Anxiety and Physics Performance of Non-Physics Students**

PPJ, Vol. 35 (2013), pp. 24-34

Edelyn Alicar-Cadorna Ph.D, Grace A. Garcia MST Phys and Magdalena A. Ebojo BS Phys

Abstract

This study investigated the mathematics anxiety and performance in Physics of 102 non-Physics students. Mathematics anxiety was measured in terms of thinking Math, taking Math test, learning Math and solving Math problems. On the other hand, Physics performance was measured in terms of content and cognitive skill levels. The descriptive- correlational method of research was used in the study. Mathematics Anxiety Scale (MAS) of Fennema-Sherman and Physics Test were employed to gater needed data in the study.

Findings show that the mathematics anxiety exist among the non-Physics students. They experience an average level of Math anxiety with average level of anxiety in learning Math and solving math problems but a high level of anxiety in thinking about math and in taking math. Meanwhile, the respondents have a low level of performance in physics. Among the Physics concepts considered, they performed at an average level in forces and work, energy and power but they performed low in vectors and scalars, one and two-dimensional motions. For the cognitive skill levels, they got an average performance in knowledge and a low performance in comprehension and application skill levels. Generally, the relationship between the overall math anxiety and overall Physics performance of the respondents is not statistically significant but anxiety in thinking about Math and overall Physics performance obtained a significant relationship.

35.05 **Interference Experiments Using Semiconductor Diode Laser**

PPJ, Vol. 35 (2013), pp. 35-44

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Abstract

A semiconductor diode laser has been utilized as light source for interference and polarization experiments. Under the interference experiments, the diffraction grating experiment obtained the experimental value of laser beam wavelength with maximum % error of 3.12 %, while the CD grating experiment obtained the experimental value of grating distance with maximum % error of 3.22%.

35.06 **Determinants That Influence Teaching Efficacy Among Tertiary Introductory Physics Faculty**

PPJ, Vol. 35 (2013), pp. 45-56

Michelle Nena Nuñez Curada
Master of Arts in Teaching College Physics

35.07 B**eginning Teachers' Views on Science Learning: A Probe on Constructive and Traditional Frameworks**

PPJ, Vol. 35 (2013), pp. 57-64

Mario P. Obrero and Mariquit M. Obrero
University of Northern Philippines
Vigan City, Ilocos Sur

Abstract

This study dealt with the traditional and constructivist views of beginning elementary school teachers on science learning. Eighty-nine respondents accomplished a questionnaire, consisting of 20 statements supporting either the traditional or the constructivist frameworks. Results showed that the five statements with the highest means were: a) Learning is the transmission of knowledge. b) Science is viewed as a codified body of knowledge; it is a set of facts, principles and procedures. c) Teachers are seen as learners themselves and as facilitators and collaborators in student learning. d) Classroom tasks are student- centered. e) Learning is the interpretation and negotiation of ideas; it is influenced by the learner's prior knowledge. The first two statements describe the traditional model while the next three support the constructivist framework. The respondents strongly agreed on four traditional views and eight constructivist views and agreed on the remaining six traditional and two constructivist statements. Beginning teachers should be trained on the use of constructivist teaching strategies to help them understand how constructivist learning differs from traditional learning, and to equip them with the skills of implementing a

constructivist science classroom.

35.08 **Spatial Ability and Understanding of Graphs in Kinematics Among College Students**

PPJ, Vol. 35 (2013), pp. 65-76

Edelyn Alicar-Cadorna Ph D, Erwin F. Cadorna, Ph D and Felicidad D. Quario Ed D

Abstract

The study analyzed the spatial ability and understanding of graphs in kinematics of college students. Spatial ability was measured along developments, rotation and visualization. On the other hand, students' understanding of graphs in kinematics was focused on topics related to the interpretation of a slope of a line and area under a curve or line. The descriptive research design was employed in the study. The 203 students who were enrolled in Physics I completed the Purdue Spatial Visualization Test and the Test of Understanding of Graphs in Kinematics (TUG-K). The latter probed the students' understanding of graphs in kinematics. Findings reveal that the students generally had an average level of spatial ability. They had an average level of ability on rotation, a low level of ability on visualization, but a high level of ability on developments. Meanwhile, the students had a low level of understanding of graphs in kinematics. They cannot fully understand how to interpret the slope of a curve or a line and the more they cannot understand how to determine the area of a curve or a line. Findings also show that there was a significant influence of students' spatial ability on understanding of kinematics graph. Spatial ability along rotations and views, and sex predict the students' understanding of kinematic graphs.

35.09 **Physics Teachers' Constructivist-Related Instructional Practices**

PPJ, Vol. 35 (2013), pp. 77-87

Edelyn Alicar-Cadorna Ph D and Erwin F. Cadorna, Ph D

Abstract

The study examined the instructional practices linked with constructivism that are used by physics teachers in secondary schools. Using the descriptive normative research design, 45 physics teachers in selected secondary schools in the Division of Ilocos Sur, Vigan City Division and Candon City Division were requested to answer survey items which probed constructivist-related instructional practices. The instructional practices related to constructivism were classified into

cognitively challenging and active learning.

Findings showed that, generally, the physics teachers used instructional practices related to constructivism in theri classes. There were more teachers who used cognitively challenging instructional practices than active learning in Physics classes. In particular, the most commonly used cognitively challenging practice was problem solving and the most commonly used active learning practice was group work. They used these constructivist instructional practices when introducing new information, using learning activities and in assessing Physics learning.

35.10 **An Improvised Physical Pendulum with a Resistive Displacement Sensor**

PPJ, Vol. 35 (2013), pp. 88-99

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Abstract

This study aimed to improvise a physical pendulum with sensor that can measure angular position and displacement, design and construct an instrumentation amplifier that could interface the sensor to a computer via a National Instrument NI USB-6009 data acquisition device.

A nichrome wire was formed into a semi-circle loop. Using a carbon brush as a slider, a potentiometric sensor was formed which was then connected to a Wheatstone bridge of the instrumentation amplifier.

When the pendulum moves, the carbon brush attached to it slides over the nichrome wire thereby changing the effective resistance causing an imbalance in the Wheatstone bridge resulting to an ouput voltage.

Plotting the output voltage with the angular displacement in rad made it possible to calibrate the sensor to measure the angular position in terms of the output voltage.

35.11 **Frequency Optimization and Calibration of An Improvised Rotational Variable Differential Transformer**

PPJ, Vol. 35 (2013), pp. 100-112

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Abstract

This study aimed to improvise a rotational variable differential transformer (RVDT) and analyze its response to different excitation frequency coming from an electronic oscillator. This improvised apparatus can be used as a teaching material in physical electronics, instrumentation and experimental physics.

An oscillator was built based on a universal timer IC 555 wherein one of the resistors was replaced with a potentiometer to produce variable frequency. The oscillator can produce an output square wave with frequency ranging from 25Hz to 1kHz. The output of the oscillator was amplified by a power transistor 2N3055 which can provide current up to 5 A, to drive the primary coil of the RVDT. The oscillator was utilized basically to determine if the primary coil cab resibate wutg a certain frequency. Resonant condition means maximum current on the primary coil.

Results showed that the primary coil did not resonate with a frequency anywhere from 25 Hz to 1kHz. The theoretical resonant current (when imedance, Z is equal to coil R) of the coil at 6.45 V DC is 0.45 A, R of the coil is 13.0 ohms. When the excitation voltage is 6.22 V, 60 Hz from an ordinary step-down transformer the primary coil current is 0.26 A, comparable to the current when the excitation voltage comes from the oscillator. The improvised RVDT was calibrated using an ordinary step-down transformer giving the following results.

When the input voltage is 3 volts and for the clockwise rotation, the voltage output changes at a rate of 0.2521 mV per degree while for the counter clockwise rotation, the voltage change is 0.2479 mV per degree. When the excitation voltage is 6 volts, the output voltage changes 0.5671 mV for every degree of clockwise rotation and 0.6138 mV for every degree of counter clockwise rotation. When the excitation voltage is 9 volts, the output voltage changes 0.8424 mV for every degree of clockwise rotation and 0.9224 mV for every degree of counter clockwise rotation .

The results of t-test effectively set the effective range of the improvised apparatus as follows: (a) for 3 volts input voltage, $5 - 45^{\circ}$ clockwise rotation and $0 - 40^{\circ}$ counter clockwise rotation; (b) for 6 volts input voltage, $10 - 45^{\circ}$ clockwise rotation and $0 - 35^{\circ}$ counter clockwise rotation; (c) for 9 volts input voltage, $0 - 35^{\circ}$ clockwise and counter clockwise direction.

35.12 **Measurement of the Specific Heat of Sand Samples From Southern Leyte with**

A Self-Constructed Calorimeter
PPJ, Vol. 35 (2013), pp. 113-122
Gerardo C. Maxino Ph D and Jon Assam M. Mascardo
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Abstract

A calorimeter was constructed out of inexpensive readily available local materials. Tests conducted on the calorimeter with experiments on the latent heat of fusion yielded errors ranging from 0.625% to 9.88 % with an average error of 4.47%.

Sand samples were taken from all towns of Southern Leyte. The values of the specific heat ranged from 0.199 cal/g C° to 0.254 cal/g C°.

35.13 **34th Annual National Physics Seminar-Workshop Convention**
25th National Physics Olympics
20th National Physics Fair
April 12-15, 2012
Colegio De San Juan De Letran-Calamba
Calamba City, Laguna
Theme: ”Physics, Nationalism, and Development”
578 Participants

35.14 **PPS MARCH**

Philippine Physics Journal, Vol. 34 (2012)

34.01 **Revisiting Students’ Early and Recurring Experiences and Perceptions about Physics**
PPJ, Vol. 34 (2012), pp. 1-9
Engr. Hadji Chua Alegre, MAT
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Abstract

This descriptive research aimed at identifying students’ early and recurring experiences and perceptions about Physics. It attempted to look into the experiences and perceptions of 100 BS Nursing sophomore

students who were enrolled in Physics at Manila Tytana Colleges (formerly Manila Doctors College) during the second semester, AY 2009-2010. Journals written by the respondents based on pointers culled from a questionnaire were analyzed and discussed individually. Findings revealed that Physics is a real big frustration to students, but regarded as a challenge to them. Students confirmed that their achievements in Physics are very much affected by their attitudes and anxiety. Finally, results of the study indicated that teachers can relate with students and their predicament about Physics by employing relevant teaching strategies that established connections to their everyday life that made learning of Physics light, nice and easy.

34.02 **An Apparatus to Demonstrate the Principle of Equivalence**

PPJ, Vol. 34 (2012), pp. 10-15

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Abstract

This paper presents an apparatus to demonstrate the Principle of Equivalence, which states that gravitational effects are the same as, or cannot be distinguished from, the effects of acceleration.

34.03 **Climate Literacy Among College Students: An Analysis**

PPJ, Vol. 34 (2012), pp. 16-22

Mario P. Obrero and Mariquit M. Obrero
University of Northern Philippines
Vigan City, Ilocos Sur

Abstract

This study was conducted to examine college students' climate literacy and its relationship to the students' characteristics, namely, gender, age, place of residence, year level, high school graduated from, self-ssessed general level of awareness on climate change, level of energy use and number of one-way trips to school per week.

A Climate Literacy Questionnaire was administered to 99 students. The instrument measured their levels of knowledge on global warming, causes of climate change and actions to slow down climate change.

Results show that the students had a high overall level of climate literacy, and a high level of knowledge on global warming, a very high

level on the causes of climate change, and a high level on the actions to slow down climate change. Significant differences in the literacy levels were obtained between and among subgroups according to year level and age. Further, regression analysis results indicate that year level is the best predictor of climate literacy.

It is concluded that college students are knowledgeable about global warming, causes of climate change and actions to reduce climate change. Future work may be done to determine the extent to which college students contribute in controlling climate change.

34.04 **A Survey on Environmental Issues Among University Students**

PPJ, Vol. 34 (2012), pp. 23-26

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Philippine Normal University
Alicia, Isabela

34.05 **Graph Interpretation Skills in Kinematics: A Study Among Second Year Engineering Students**

PPJ, Vol. 34 (2012), pp. 27-32

Erwin F. Cadorna, Ph.D. and Edelyn Alicar-Cadorna, Ph.D.

Abstract

This paper reports a study of the skills in interpreting kinematics graph among the engineering students in the University of Northern Philippines, Tamag, Vigan City. The students had finished the general physics courses. Kinematics graphs were focused on x-t, v-t, and a-t graphs. This study made use of the exploratory type of research. The students completed a written instrument, the Test of Understanding Graphs-Kinematics (TUKG-K), adopted from Beichner (1996). The influence of students' personal variables and mathematics grades on graphical interpretation skills were likewise looked into in the study.

Findings show taht, generally, the engineering students under study only had an average skill in interpreting kinematics graphs. They were found to have a moderate skill in interpreting v-t graphs and a-t graphs but high skills in interpreting x-t graphs. Moreover, they were skillful in finding the velocity given the x-t graph but not skillful in finding the acceleration and distance, given the v-t graph. Likewise, they were not skillful in finding the change in velocity, given the a-t graph; in identifying the corresponding graph, given the text explanation of the graph.

34.06 **An Investigation on the Morphology of Spin-Coated YSZ Thin Film in Silica Substrate**

PPJ, Vol. 34 (2012), pp. 33-39

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Abstract

Different concentrations of yttria stabilized zirconia (YSZ) grown on silica (SiO 2) substrate were investigated in this paper. Suspension containing 10wt%, 30wt% and 50wt% YSZ were fabricated using the 10spin coating technique on silica keeping all other parameters constant such as the coating parameters and sintering temperature. The surface morphology and thickness of the films were investigated using scanning electron microscopy (SEM). Results showed porous YSZ films which become less porous as the concentration of YSZ increases. The thickness of the films was also affected by the YSZ concentration. As the concentration increases, the thickness of the films also increases. The crystal structure of the fabricated films as also determined using X-ray Diffraction (XRD) and Raman Spectroscopy. Both techniques revealed a cubic fluorite structure independent of the concentration of YSZ.

34.07 **Statistical Analysis and Curve Estimation of Climate Variability in the Ilocos Provinces**

PPJ, Vol. 34 (2012), pp. 40-49

Mario P. Obrero adn Mariquit M. Obrero
University of Northern Philippines
Vigan City, Ilocos Sur

Abstract

This study aimed at analyzing climate in Ilocos Sur and Norte based on the two provinces' respective profiles on mean temperature, mean rainfall, mean relative humidity and mean sea level pressure. Descriptive and inferential statistics including curve estimation technique were used in the analysis of the recorded monthly data for the years 2007- 2009 obtained from PAGASA Provincial Substations. Results show that the obtained data on mean temperature, mean rainfall and mean sea level pressure of Ilocos Norte were more variable than those of Ilocos Sur. In terms of mean relative humidity, Ilocos Sur had greater variability than Ilocos Norte. However, the differences in the climate data of the two provinces were not statistically significant. Results also revealed increasing trends in mean temperature, mean rainfall, mean relative humidity and mean sea level pressure in Ilocos Norte. The same patterns were observed in Ilocos Sure except on mean temperature and sea level pressure in which the trends are decreasing.

34.08 **Low-Cost Venturi Meter: Understanding Bernoulli's Equation Through a Demonstration**

PPJ, Vol. 34 (2012), pp. 50-57

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Abstract

This study intended to concretize Bernoulli's principle through a low-cost Venturi meter designed and constructed by the researchers. Specifically, this paper aimed to improvise a device that can measure flow speeds of water both in the wide and narrow portions of a horizontal piping system for which the pressure difference is provided by a differential height revealed in the attached manometer. A mechanism which regulates volume flow rate of liquid was attached to Venturi meter to generate several trials required to establish accuracy of setup in demonstrating Bernoulli's principle.

This investigation about improvisation of appartatus required experimental development method especially in assembling various components which included PVC pipe, aluminum pipe, manometer, DC pump, variable flow controller, and a plastic container as water reservoir. The final model of the apparatus evolved from a series of functionality test sessions with experts and consultants. To determie the accuracy of the instrument, nine trials – that is three each for the three adjusted flow rates – were performed.

Findings revealed that the improvised Venturi meter can concretize Bernoulli's principle. Its accuracy in flow speed determination was high since average percentage of error for minor turbulent flow was 12.52 percent while that for laminar was 3.86 percent.

34.09 **Spatial Abiltiy and Physics Performance of College Students in Abra Valley Colleges**

PPJ, Vol. 34 (2012), pp. 58-73

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34.10 **Forecasting Power Load Demand Using Holt-Winters Model**

PPJ, Vol. 34 (2012), pp. 74-84

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Abstract

Virtually time series observations such as power load demand follow some seasonal patterns. Electric service utilities depend on most quantitative forecasting models. This paper presents forecasting procedure using the Holf-Winters exponential smoothing model. Since data were stochastic and assumed to follow a multiplicative seasonality, this study adopts the classical decomposition method in the analysis of seasonal data. Decomposition is an approach of separating the time series into its component parts. The components of the Holt-Winters model include the level, trend, the seasonal index, and randomness with some smoothing constants which are estimated. Power load demand data are categorized as commercial, residential, industrial or others, from a given area of a power utility. The purpose of this study is to develop long-term forecasts of the power load demand in Cagayan de Oro City as well as to promote the use of Holt-Winters model as a time series forecasting method. With some numerical results, the Holt-Winters model predicts the patterns of power demand over a given time interval.

34.10 **Health and Radiation: An Insight from Fukushima Nuclear Disaster**

PPJ, Vol. 34 (2012), pp. 85-90

Loreto B. Feril, Jr.[1], Dave F. Bargamento[2], Kazuki Yamaguchi[3], Ryohei Ogawa[3], Zheng-Guo Cui[3], Yoshiaki Tabuchi[3], Yukihiro Furusawa[3], Takashi Kondo[3] and Katsuro Tachibana[1]

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34.11 **Seawater Salinity in Siquijor Island, Philippines**

PPJ, Vol. 34 (2012), pp. 91-97

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Climate Studies Center

Maxino College

Dumaguete City

Abstract

Seawater salinity was measured in eastern, western, and southern Siquijor Island using two methods: boiling and conductivity measurement. The results of the two methods are in close agreement with each other.

34.12 **33rd National Physics Seminar-Workshop Convention**
24th National Physics Olympics
19th National Physics Fair

April 6-9, 2011

Silliman University

Dumaguete City, Negros Oriental

Theme: ”Physics and Environmental Well-Being”

285 Participants

34.13 **Seminar-Workshop for Science Educators**
Philippine Physics Society and
Notre Dame University

September 23-24, 2011
College of Arts and Sciences
Natural Sciences Department
Cotabato City
Theme: ”Science Educators: Responding to Current Trends and Challenges”
57 Participants

34.13 **PPS MARCH**

Philippine Physics Journal, Vol. 33 (2011)

33.01 **Biohydrogen Fuel Yield of Thermophilic Heat Pretreated Mixed Inoculum from Sugarcane Mill Wastewater**

PPJ, Vol. 33 (2011), pp. 1-10

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Abstract

Various pretreatment methods including heat have been conducted on the mixed inoculums to enrich hydrogen producing bacteria (HPB). This study investigated the use of heat as pretreatment method for the anaerobic sludge at 105 °C ranging from 45,60,90 and 120 minutes to determine the optimum time to suppress methanogenic activity and enhance hydrogen production using artificial wastewater. Optimum time of heating the inoculum obtained from the experiment was applied to the sugar mill wastewater as substrate. Sugarcane mill wastewater was also diluted 50% to see the effect on H_2 production. Results f batch experiments showed that the heat treatment at 105 °C regardless of time duration of heating showed no activity for methanogenic bacteria. There is an increasing trend of

hydrogen production with the increase in heating time at 105 °C regardless of sucrose loading (10g/L and 20g/L) with the highest value recorded at 120 minutes (3.24 mol H_2/COD for 10g/L and 4.26 mol H_2/gCOD for 20g/L). Results for sugarcane mill wastewater revealed an increasing trend of H_2 production with the highest value of 2.38 mol H 2 /gCOD observed for 100% substrate loading (without dilution) and 1.75 mol H_2 /gCOD for 50% dilution indicating a suitable source for clean energy production.

33.02 **Development and Utilization of an Experimental Resonance Tube Setup with Laptop-Generated Sound Source**

PPJ, Vol. 33 (2011), pp. 11-16

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Bukidnon, Philippines

Abstact

An experiment resonance tube setup consisting of an economy resonance tube, laptop computer, desktop speaker and digital thermometer was developed and utilized inside the physics classroom in the Bukidnon State University, Malaybalay City, Bukidnon. The experiment values of speed of sound v_{sound} at room temperature were deduced through frequency-vs-harmonic number *(f-vs-n)* experiments. These experiments include open-pipe and stoped-pipe procedures in several trials. Room temperature has been found changing at different time intervals of the day and weather conditions so that frequency-vs-harmonic number *(f-vs-n)* were performed at different room temperatures at different time intervals.

33.03 **Alternative Conceptions in Force and Gravity: Differences Between Secondary and Tertiary Students**

PPJ, Vol. 33 (2011), pp. 17-32

Erwin F. Cadorna, Ph.D and Edelyn Alicar-Cadorna, Ph.D

Abstract

This paper reports a study of the alternative conceptions held by secondary and tertiary students with focus on the total force on a ball thrown vertically, forces on a ball thrown along a parabolic path, and gravity when in orbit around the earth. This Study made use of the exploratory type of research. The students completed a written instrument which probed their understanding of force annd gravity. Analysis was given emphasis on the reasons givenby the students in support to their answer.

Findings reveal that the students have quite serious misunderstanding about the concept of force and gravity. Generally, the secondary students and the tertiary students have more less the same belief that force is in the direction of motion; that if a ball is moving upward, there must be a continious force acting in that direction; that the force of throw remains on the balluntil it reaches the highest point of its flight; and that anything which isat rest does not experience anay force. Moreover, they also believe that there is no gravitionalforce acting on freely falling object, and there is no gravity n the moon. There is, however, a greater proportion of secondary students who have these misconceptiosns. Moreover, differences lie between the secondary and the tertiary studentsn the reasons they providein supportto their answers. The secondary students gave more inconsistent reasons than the tertiary students: anything which is at rest does not experience any force. Morever, they also believe that there is no gravititional force acting on freely falling object, and there is no gravity on the moon. There is however, a greater proportion fo secondary students who these misconceptions. Moreover, differences lie between the secondary and the tertiary students on the reasons they providein supportti their answers. The secondary students gave more inconsistent reasons than the tertiary students.

33.04 **Teaching Understanding in Physics**

PPJ, Vol. 33 (2011), pp. 33-40

Eng. Philip P. Carpina
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33.05 **Some Techniques of Solving for the Acceleration of an Atwood's Machine**

PPJ, Vol. 33 (2011), pp. 41-46

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Abstact

This paper presents two approaches of solving for the acceleration of an Atwood's machine. These are along Newtonian mechanics and Langrangian mechanics. For the former, three techniques are offered: direct application of Newton's law of acceleration; Gaussian elimination; and, the use of determinants.

33.06 **Scientific Reasoning Ability and Physics Performance of the Scholars of the Philippine Science High School-Ilocos Region Campus**

PPJ, Vol. 33 (2011), pp.47-60

Sharon L. Palamares, MST Physics
SST-Physics, PSHS-IRC

33.07 **College Physics Learning Environment: Its Influence on Student's Attitudes and Academic Efficacy**

PPJ, Vol.33 (2011), pp.61-67

Mario P. Obrero, Ph.D
University of Northern Philippines, Vigan City, Ilocos Sur

Abstract

This study was conducted to investigate the influence of learning environment on colllege student's attitudes towards learning physics and academic efficacy. Results revealed that the student's learning environments are very satisfactory in almost alldimensions. The student's 17attitudes are moderately favorable in four dimensions, namely: personal, interest, problem solving (general), problem solving confidence, and sense-aking/effort. The students had very satisfactory overall learning environment and a moderate favorable averall attitude and academic efficacy. Significant positive correlations exist between learning environment, and attitude towards learning physics and academic efficacy. College physics students should be exposed to learning environments which promote positive attitudes towards the subject and enhance academic efficacy. Instructional tasks should be varied, creative, interesting, interactive, and relevant to the real world.

33.07 **Student's Attitudes Towards Physics at Siquijor State College: A Study Report**

PPJ. Vol. 33 (2011), pp. 68-77

Roel D. Taroc, Ph.D
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Abstract

This study aimed at investigating the student's attitude towards

Physics particularly on teaching strategies, concepts, laboratory apparatus/equipment, outputs and assignments at Siquijor State College. The descriptive survey method was used in the research process.

33.08 **Thermal Radiation Properties of Locally Available Contruction Materials**

PPJ. Vol. 33 (2011), pp 78-85

Hope M. Badal, Ph.D. and Mary Ann Cruz
Physics Department, Silliman University

This article reports the results of a study done on thermal radiation properties of locally available construction materials using a radiation cube and a corresponding radiation sensor. The study's findings includes results on (a) the thermal radiation intensity associated with each material (b) the percentage of thermal radiation that each material is able to block, and (c) relative measures of the emissivity of materials, obtained by comparing the slopes of the sensor readings vs. T 4 graphs for the different samples.

33.09 **Creation of Temperature and Rainfall Profiles for Bagacay, Dumaguete City and Maloh, Siaton, Negros Oriental**

PPJ. Vol. 33 (2011), pp. 86-92

R.G Tubog and C.C Maxino
Climate Studies Center, Maxino College, Central Bagacay, Dumaguete City

Abstract

This study was conducted to address the scarcity of climate data in the Philippines. Temperature and rainfall data were gathered for a period of six months (July-December, 2010), for two sites in Negros Oriental: Bagacay, Dumaguete City and Maloh, Siaton. Simple, inexpensive methods were used in the measurement of temperature and rainfall. Comparisons with data from PAGASA's meteorological observation station in Dumaguete City, showed that the temperature profiles obtained for the sites were similar to that of PAGASA's, while only the rainfall profile of Bagacay was similar to PAGASA's. The results further show that the measurement methods used in the study produce data comparable to data gathered by PAGASA.

33.10 **List of Participants**

32nd Annual Natinal Physics Seminar-Workshop Convention

23rd National Physics Olympics
18th National Physics Fair
April 7-10, 2010
Xavier University
(Ateneo de Cagayan)
Theme: ”Physics and Climate Change”
247 Participants
93 Schools/Institutions
From Luzon, Visayas, Mindanao

33.11 PPS MARCH

Philippine Physics Journal, Vol. 32 (2010)

32.01 **Fabrication and Characterization of Melt Quenched Lead-Doped BSCCO Superconducting Ceramics**
PPJ, Vol. 32 (2010), pp.1-9
Shirley Tiong-Palisoc, Ph.D
De La Salle University, Manila

32.02 **Peer Instruction: Its Effect on Conceptual Understanding and Confidence of Engineering Students Taking Calculus-Based Introductory Physics**
PPJ, Vol. 32 (2010), pp. 10-23
Bobby D. Manlapig, Darwin L. Saludez and Fe Novida and May Lozada
Physics Department, Mapua Institution of Technology Intramuros Manila

Abstract

This study focused on the effect of Peer Institution (PI) in the conceptual understanding and confidence level of engineering students taking up calculus-based introductory physics. The method was highlighted with the use of conceptual questions called ConcepTest that were posed on the class after discussing central points in a topic. Each students explained the correctness of his answer on each ConcepTest with a partner. The students also gave their confidence level on their answer before and after PI. The scores of students in the experimental and the control group on pretest both showed that there was a significant *(p¡ 0.05)* increase in

their conceptual understanding. However the results also showed that the increase in conceptual understanding of the students in the experimental group was significantly higher than that of the students in the control group. On the other hand, the results also showed that there was a significant increase in the students' confidence level towards their answer on each ConcepTest posed on them.

32.03 **Benefits from the Use of the Demonstration Strategy in Teaching Physics**

PPJ, Vol. 32 (2010), pp. 24-29

Joel V. Lubrica, Ph.D
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Abstract

This study investigated responses of 21 fourth year Bachelor of Secondary Education (major in physical science) students on the use f demonstration strategy in their physics classes. Specifically, it considered a) the appropriateness of the strategy; b) the frequency of utilization of this strategy by their own physics teachers; c) the extent to which certain teacher characteristics are shown when strategy is used; 20and, d) the extent to which certain student behaviors are elicited when the strategy is utilized. Data collection was through a questionnaire. Statistical treatment involved arithmetic means based on the assumption that the Likert-type data obtained can be considered as interval in nature. Results shw that: a) all the respondents considered the strategy as appropriate for their physics lessons and thought that it should be used more frequently by their teachers; b) when a physics teacher used the demonstration strategy, this utilization showed very greatly that their physics teacher had, among other characteristics, mastery of subject matter, wanted to make the classroom environment more conducive to learning,and recognized that the students were diverse; c) the use of the strategy by their physics teachers very greatly motivated students to get higher grades and to learn more about physics, stimulated them to ask more 'Why' and 'How' questions, and inspired them to become more independent learners and to become teachers of physics in the future, among others.

32.04 **Parallel Plate Capacitor**

PPJ, Vol. 32 (2010), pp. 30-32

Raymund S. Vizcarra,CE, MSc,Ph.D (cand) and Fr. Francisco Glover,

S.J., Ph.D
Physics Department, Ateneo de Davao University,
Jacinto St., Davao City

32.05 **Dielectric Constant of Water**

PPJ, Vol. 32 (2010), pp. 33
Raymund S. Vizcarra,CE, MSc,Ph.D (cand) and Fr. Francisco Glover,
S.J., Ph.D
Physics Department, Ateneo de Davao University,
Jacinto St., Davao City

32.06 **Half-Century of Physics in Central Visayas: A Remembrance**

PPJ, Vol.32 (2010), pp. 34-39
Gerardo C. Maxino,Ph.D
Maxino College
Dumaguete City 6200

Abstract

A participant-obsever reminices about the beginnings and ups and downs of physics education in Cental Visayas, as well as assesses its current status and challenges. This brief historical account pinpoints the real force and strenght and core elements that sustained the development of physics and physics in the region and other parts of the country the region has been able to serve.

32.07 **Design and Construction of an Inexpensive Basic Sonometer**

PPJ, Vol. 32 (2010), pp 40-46
Hope Maxino Bandal,Ph.D and Kenny P. Vargaño
Silliman University, Dumaguete City

Abstract

A basic sonometer is constructed using locally-available material. Total material. Total material cost is only about one thousand pesos. Labor cost were minimal. Soldering of metal parts and shaping of the wooden parts were done at the Physics shop of the Physics Department of Silliman University.

Preliminary experiments were conducted to test the reliability of the sonometer as means of determining the fundamental frequencies of vibrating strings. Percentage errors in the frequency values ranging from less than 1% to just a little greater than 10% for the different wire and

string samples were obtained but mostly at the lower percentage error end. Four kinds of materials were used as strings and wire, namely coralon string (a black, relatively heavy string used in the making of nets), nylon string, iron wire, and copper wire.

Aside from using the constructed sonometer to obtained the fundamental frequency values f the wires and strings, this was also used to obtain the linear density values of the samples wires with relatively good results for tyhe iron wires.

32.08 **Therapeutic High Intensity Focused Ultrasound**

PPJ, Vol. 32 (2010), pp 47-52

Loreto B. Feril, Jr., M.D., Ph.D.[a,*], Katsuro Tachibana,M.D., Ph.D.[a] and Takashi Kondo Ph.D[b].

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Abstract

Medical use of ultrasound is rapidly advancing not only in medical imaging or sonography but also in the use of ultrasound for therapeutic benefit. Several studies at different levels are currently underway and the clinical use of high intensity focused ultrasound (HIFU) in an increasing number of medical conditions such as prostate tumors, abdominal tumors, atrial fibrillations, vascular conditions, and many others is highlighting the significant advances in this field. Rapidly rising number of research works on this area in recent years may help us foresee a future with ultrasoud, particularly HIF, playing a major role in the field of medicine.

32.09 **ZnTe-Zn(S,Te) Superlattices**

PPJ, Vol. 32 (2010), pp. 53-58

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[b] Physikaliches Institut, Universitaet, Wuezburg,Germany

Abstract

ZnTe-Zn(S,Te) short-period superlattices were grown on (001) GaAs substrates with very good structural quality. The growth conditions were found to be quite reproducible, leading to series of samples with periods between 12 Å and 29 Å. Characterization of the samples with high

resolution x-ray diffraction confirmed high structural quality showing that all samples were pseudomorphically grown. The relaxation behavior was strongly influenced by the ZnTe well-width with two critical observed ZnTe-thicknesses.

32.10 **Conceptual Change in an Active Learning Environment**

PPJ, Vol. 32 (2010), pp. 59-64

Theresa O. Corcoro,Ph.D
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The study aimed to investigate the effect of Active Learning in the conceptual understanding of physics by college students. Specifically, it aimed to determined the level f conceptual understanding and level of confidence of the students exposed to Active Learning prior to and after the instructions. It further determined the types of conceptual changes in students exposed to Active Learning. Furthermore, it aimed to determine the students' conceptions on Electricity prior and after Active Learning instruction and the students' views on Active Learning.

The study used a descriptive research design. It involved one section of engineering students at Notre Dame University, Cotabato City. A 21-item open-ended multiple choice Conceptual Test n Electricity, a 26-tem Questionnaire on Students' Views on Active Learning , unstructured interview aand journal entries were utilized to gather the data that were subjected to qualitative and quantitative analysis. The findings of the study revealed that generally, Active Learning is effective in increasing the level of conceptual understanding of college physics students specifically improving thier semantic conceptual understanding. The study also revealed that, students have positive views towards the use of Active Learning in the classroom. Active Learning has developed in them independent thingking, a sense of responsibility in their learning, allowed them to actively participate in class and to share their own idea.

32.11 **Understanding Satellite Motion**

PPJ, Vol. 32 (2010), pp. 65-68

Vicente Simplicio M. Villegas
Samar State University, Catbalogan City, Western Samar

Abstract

A demonstration activity can be designed to show how orbiting

motion may effect the concept of ”steady-state” motion and eventually resolve the understanding that orbiting motion of satellites subsumes its spinning motion when observed from a reference point external to the moving system.

As for steady-state observation of statellites, bodies representing statellite and earth are marked. Orbit and spin motions of statellite and earth require the same time to complete respective motion. Observations from marked bodies are taken. Results will approximate steady-state.

As for the demonstration as to how statellites can exhibit spin motion while orbiting a central body without spinning in place while in orbit motion, bodies representing moonn and earth are respectively marked. Satellite orbits earth with one side facing earth at all times. Design a marker with two opposite sides to represent rigid axis of moon. As moon orbits, lunar axis mark stays put overhead moon body with respect to external reference point. Observed orientation of moon with respect to axis marker at four (4) strategic points in the oval path. Results will show spinning motion of the orbiting body.

32.12 PPS MARCH

Philippine Physics Journal, Vol. 31 (2009)

31.01 **Gene Transfection Through Microbubble-Aided Sonication in Cancer Cells**

PPJ, Vol. 31 (2009), pp. 1-7

Dickerson C. Moreno, Ph.D.[a], Loreto B. Feril, Jr.,M.D., Ph.D.[b,*],, Katsuro Tachibana,M.D., Ph.D.,[b]., and Yutaka Irie, M.D.[b]

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Abstract

Objective: To determine the effects on transaction rate of microbubble-aided ultrasound-mediated gene transfection (sono-transfection) of various sonication .

Methods: Two cancer cell lines were used, namely HeLa and U937. Enhanced green flourescent protein (eGFP) genes and microbubbles were added into the cell cultures right before sonication. The sonication

parameters were varied with respect to burst frequency, intensity and sonication time. Each cell line was assayed initially with the flourescent microscopy and then with the flow cytometry for a more accurate transfection rate determination.

Results and Discussion: The results show significant transfection rate differences between the unsonicated and the sonicated samples. The transfection rates of both cell lines varied with sonication time, burst frequency and intensity. These results may help optimize sonotransfection in line with its potential application for cancer gene theraphy.

31.02 **Educators' Perspectives of the Government Funded Science Education Program in the Philippines 2007 Master in Physics: A Dramaturgical IDI**

PPJ, Vol. 31 (2009), pp. 8-18

Rene B. Cabrera
University of San Carlos, Cebu City

Abstract

This study is entitled Educators Perspectives of the Government Fuded Science Education Program in the Philippines 2007 Master in Physics: A Dramaturgical In-Depth-Interview. The general objective of this study is to make an initial qualitative curriculum assessment and evaluation. Specifically it intends to address the following odjectives: (1) To draw out perspective from the educators in the implementation of the Master in Physics (MP), (2) To contextually analyze the derived perspective drawn from the respondents in promoting better curriculum addressed to solve or minimize the present education problems related to program quality, and (3) To present insights which may be needed for the MP Curriculum Evaluation, Assesment and Monitoring for its improvement. In so doing, this research endeavors to provide answers to the following questions: How was the MP program originally conceived in terms of its goals to be amcomplished? How are the goals accomplished? What insights were observed that make the program succesful? What major MP curriculum problems did the educators encounter and are these problems resolved?

This research uses *dramaturgical in-depth interview* - a technique popularized by a sociologist Erving Goffman in the early 1960s in drawing out the perspective of the respondents on the implementation of the MAP program. The dramaturgical orientation in this study is similar in some ways to what Douglas (1985) initiated in terms of creative interviewing. This study creating an appropriate climate for informal exchanges and for

mutual disclosures. The approach used was a kind of standardized interview with mostly open-ended questions in a scheduled form, although unscheduled ones were also applied in probing especially when the interview questions seemed unclear to the respondents. Some of the constructed interview questions also seem to be double-barreled (a limitationof this qualitative study with a novice reseacher) but were clarified in the conduct of the interview .This query was conducted using a structured interview process where three among the five faculty members handling the major MP courses were individually interviewed in a closed room in about one hour duration. The remaining two faculty members were excluded in the interview to minimized biases because they were major reseachers of this study.

31.03 **Self Description and Academic Perfomance in Physics and Mathematics**

PPJ, Vol. 31 (2009), pp. 19-22

Josephine Caridad S. Borje, Bretel B. Dolipas, Jennifer Lyn S. Ramos
Benguet State University, La Trinidad, Benguet

Abstact

This study aimed to determined the association between the self description factors to academic performance in mathematics and physics of students enrolled in Bachelor of Science in Information Technology (BSIT) and Bachelor of Science in Applied Statistics (BSAS) courses. The result of the research could be used to improve the performance of students in mathematics and physics.

The finding shows that self description on mathematical ability, problem solving ability, and on the same sex peer relations were highly associated with the achievement in mathematics of Bachelor of Science in Applied Statistics students and Bachelor of Science in Information Technology students. The overall self description of BSIT and BSAS students were associated to their mathematical performance.

31.04 **Simplified Automatic Timer Device for PC and Stopwatch**

PPJ, Vol. 31 (2009), pp. 23-29

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31.05 **Density Functional Theory Investigation on the Adhesion of Epoxy Ortho-Cresol Novolac Monomer to Aluminum**

PPJ, Vol. 31 (2009), pp. 30-34

A.A. Padama[a,b], A.R. Villagracia[b], N. Arboleda[b], R.Pobre[b], and R.Quiroga[b]
[a] Philippine Normal University, Manila
[b] Physics Department, CENSER, De La Salle University, Manila

The adhesion strength of epoxy ortho-cresol novolac (EOCN) resin monomer to aluminum atm was calculated using Density.

31.06 **Various Pulley Systems**

PPJ, Vol. 31 (2009), pp. 35-42

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Abstact

The construction or assembly of four pulley systems, utilizing a total of three double pulleys and three single pulleys, is presented in this paper. Activities to show Ideal Mechanical Advantage (IMA) and Actual Mechanical Advantage (AMA) are described. From computations of IMA and AMA, the efficiency of a system can be calculated.

31.07 **Movie Scenes as Valid Simulations of Selected Fundamental Physics Concepts**

PPJ, Vol. 31 (2009), pp. 43-46

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and
University of the Immaculate Conception
Fr. Selga St., Davao City

31.08 **Physics in Resources Recycling: Jig Separation of Plastics**

PPJ, Vol. 31 (2009), pp. 47-54

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Abstract

Recycling has gained attention nowadays due to the increasing awareness in sustainable development. The recycling of waste plastics has become one of the priorities because of the rising consumption and generation of plastic wastes from different sectors of the society. Waste plastics are composed of a mixture of different types of plastics and need to be separated before they can be recycled. Several techniques were investigated or developed to separate plastics and one of them is jig separation. Jig separation is based on the displacement of particles in a bed fluidized by the pulsation of the fluid in a vertical plane so as to produce stratification. The principles behind jigging are governed by physics, particularly the motion of particles in fluid. This paper presents the theories proposed to effect particle separation by jigging. Studies on the application of jigging to separate different kinds of plastics were reviewed. It can be concluded that jig separation can be applied for plastic saparation and recycling. However, more research and development effort is required before a commercial scale application can be established.

31.09 **Viscosity of Chitosan from Squid Pen as Scar Remover**

PPJ, Vol. 31 (2009), pp. 55-59

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Abstract

This study focuses in the investigation of chitosan from squid pen in the formulation of scar remover. One of the methods used in the characterization of prepared chitosan was done by determining its viscosity- average molecular weight (MV). This viscosity of the solution was determined using Brookfield viscometer and the average molecular weight was calculated using Mark-Houwink equation. The nanostructure of the prepared chitosan films were scanned using Olympus CK40 phase

contrast microscope coupled with camera at 20x magnification. Preparation of chitosan films demonstrated significantly different viscosity and average molecular weight which is one of the important parameters which could influence the performance of chitosan as scar remover.

31.10 **AB Initio Investigation on Geometrically Optimized Dimer-Pyrrole and Aluminum Atom Interaction**

PPJ, Vol. 31 (2009), pp. 60-63

Al Rey Villagracia[1], Allan Padama[1], Romeric Pobre[1], Enrique Manzano[2], Ma. Carla Manzano[1] and Reuben Quiroga[1]

[1] Physics Department, CENSER, De La Salle University 1004

[2] Electronics and Communications Engineering Department, De La Salle University 1004

31.11 **Guided Inquiry Laboratory (GIL) in High School Physics**

PPJ, Vol. 31 (2009), pp. 64-75

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Tagontong, Goa, Camarines Sur

Abstract

The main objective of this study was to determine the effectiveness of guided inquiry laboratory in enhancing the performance of students in Physics along conceptual understanding, high thinking skills, science process skills and attitudes.

The guided inquiry laboratory (GIL) used in this study focused on topics on free falling motion, law of acceleration and law of interaction. The students performed the laboratory activities in small cooperative groups. As the students were engaged in the guided inquiry laboratory activities they demonstrated their cognitive skills and science process skills at varying levels. Majority of them also demonstrated positive attitudes.

Guided inquiry laboratory (GIL) was efective in enhancing students' conceptual understanding and high thinking skills based on t-test results. It was also effective in enhancing the students' science process skills which include formulating hypothesis, designing experiment, presenting data, and interpreting data. Kruskal-Wallis test applied to scores obained for these skills resulted to p-values of less than 0.05 except for laboratory skills in terms of concluding experiment and collecting data and in drawing of conclusions. Attitudes of students and the time constraints might have affected these results.

The guided inquiry laboratory (GIL) was effective in enhancing most of the attitudes explored on t-test results. The GIL improved students' attitudes concerning the challenging nature of Physics as a subject. It also enhanced their interest in learning concepts in Physics, their appreciation of independent learning process, their appreciation of active learning process, and value of curiosity, teamwork and laboratory work. Students also enjoyed learning Physics by guided inquiry laboratory.

31.12 **Synthesis and Property Optimization of Melt Quenched BPb-SCCO Superconductors**

PPJ, Vol. 31 (2009), pp. 76-80

Shirley T. Palisoc, Michelle T. Natividad and Phebe P. Mendoza
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Taft Avenue, Manila

Abstract

The melt quenched method was applied in the fabrication of $Bi_{1.6}Pb_{0.4}Sr_2Ca_{n-1}Cu_nO_y$ superconducting ceramics with n = 2.0, 2.5, 3.0 and 3.5. The samples were prepared as determined by its stoichiometric composition by melting it at 1080 °C. The melts were poured immediately onto a stainless steel plate and quenched to room temperature. The samples were ground, pelletized and annealed at a constant temperature of 840 °C for 24 hours. T c SEM and XRD measurements were made. XRD results showed the coexistence of the low T_c, high T_c and several non superconducting phases. An increase in Ca and Cu facilitate the growth of the high T_c phase.

31.13 **Conference-Workshop on Integrating Climate Change Concepts in Teaching the Sciences**

February 11, 2009
La Consolacion College – Bacolod
Bacolod City
40 Participants

31.14 **30th Annual National Physics Seminar-Workshop Convention**
21st National Physics Olympics
16th National Physics Fair
PPS Jade Celebration
April 2-5, 2008

Siquijor State College
6226 Larena, Siquijor
Theme: ”Physics and Magic, Mystics and Wizardry”
396 Participants

Philippine Physics Journal, Vol. 30 (2008)

30.01 Dual Role of Low-Dose Ionizing Radiation
PPJ, Vol. 30 (2008), pp. 1-7
Mikhail A. Buldakov[1,2] and Loreto B. Feril, Jr.[3]
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[2] Biological Institute, Tomsk State University, Tomsk, Russia
[3] Department of Anatomy, Fukuoka University School of Medicine, Fukuoka, Japan

30.02 **Experiment on Rectilinear Motion Using a PC**
PPJ, Vol. 30 (2008), pp. 9-19
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Abstract

This paper presents an experimental method of determining the magnitude of the acceleration of two bodies with different masses connected by string that passes through a pulley (an Atwood’s machine).

The acceleration is determined by approximating the time interval for successive displacement of the masses and computing the speed, v for the given time interval, *t*. The slope of the *v* against *t* plot is the magnitude of the acceleration, a.

The time interval is determined by analyzing the signal from the improvised sensors.

30.03 **Student Evaluation of Teaching: Are Physics Instructors Different From Instructors of Allied Subjects?** *

PPJ, Vol. 30 (2008), pp. 20-36
Maria Azucena B. Lubrica, Ph.D. and Joel V. Lubrica, Ph.D.
Benguet State University
* based on a paper presented by the authors at the Annual National Conference of the Philippine Physics Society, April 8-12, 2006, Aklan, Philippines

Abstract

Responses of students to a 24-item Student Evaluation of Faculty (SEF) Instrument having a 5-point Likert-type scale (i.e., Excellent, Very Good, Good, Fair, Poor) were analyzed using Rasch Measurement Theory through the rating scale model. The primary goal of the study was to characterize teachers based on the viewpoint of students. Secondarily, it was to identify differences between the perception of physics students of their own instructors and that of students of other subjects.

The study involved 3849 students of various bachelor's degree programs at Benguet State University who rated a total of 17 instructors (composed of 5 Mathematics, 6 Physics, 3 Statistics, and 3 Information Technology teachers). The distribution of students was: 1271 for Mathematics subjects, 1265 for Physics subjects, 526 for Statistics subjects, and 787 for Information Technology subjects. The rating was for the 1st semester of school year 2005-2006.

Results revealed that 17 of the 24 items were working coherently as indicators of classroom teaching performance. Apparently, the 7 other items were being interpreted by students in various ways. However, they deserved closer scrutiny because they identify where students and teachers might need to negotiate meanings. Four of these items involved time: the punctuality of teachers in coming to class, the regularity of their attendance, their prompt starting and dismissal of classes, and their prompt returning of corrected papers. The other three involved: relating subject matter to real life situation; making students feel free to inquire, express ideas, or disagree; and, (the teacher) coming to class in proper attire. Subsequent results (i.e., with the seven item misfits taken out) revealed the teachers were given the highest ratings (i.e., towards the "Excellent" side of the scale) on two items: "Shows mastery of subject matter" and "Projects good personality". In contrast, they obtained the lowest rating on "Diagnoses learning problems of students". Nevertheless, all of these ratings are still at the higher end (or toward the "Excellent" side) of the scale.

Furthermore, there were significant interactions between student ratings and subjects taught by instructors. For instance, Physics students perceived that their instructors had lesser mastery of subject matter,

compared to Mathematics students. Quite the opposite, Physics students perceived that their instructors provided up-to-date information more frequently. Results are argued to be stable due to the acceptable values of reliability and separation for both item and persons that emerged from the modeling of data. Some implication of these results to the teaching of tertiary level Physics, as well as to the refinement of the instrument, are offered.

30.04 **Secondary Students' Physics Self-Efficacy: Gender Implication**

PPJ, Vol. 30 (2008), pp. 37-43
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Abstract

This study was conducted to verify the relationship between the students' self-efficacy and their gender. The result of this research indicates that there are gender-related differences in students' efficacy in performing laboratory exercises and experiments, taking Physics examination, making science projects, and solving Physics Problem.

30.05 **Applying Rubrics in Physics Laboratory Experiments** *

PPJ, Vol. 30 (2008), pp. 44-62
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Abstract

This study aimed at investigating the utilization of scoring rubrics in evaluating students' achievement level in College Physics laboratory experiments at Siquijor State College as basis for adoption. The academic performance level of most respondents in laboratory experiments was Excellent. It implies then that students were serious in their work and exposed in conducting laboratory experiments. The scoring rubrics used to assess the achievement level of students in college physics laboratory experiments were an effective technique since it minimizes subjectivity in grading. The achievement level of the students in laboratory experiments. It

means that students with high academic performance level would have high achievement level. It was also dependent on respondent's sex. It means that male students had high achievement level compared with female students. It revealed further that male students could perform laboratory experiments better than female students.

The scoring rubrics used in this study in assessing achievement level in college physics laboratory experiments should be adopted since they are powerful tools for both teaching and assessment. Physics teachers should utilize scoring rubrics in order to reduce the amount of time spent in evaluating student work since they can often simply circle an item in the rubric, rather than struggling to explain the flaw or strength they have noticed and figuring out what to suggest in terms of improvements.

30.06 **Architecture Students' Expectations in Physics and Teachers' Perceptions**

PPJ, Vol. 30 (2008), pp. 63-74

Bobby D. Manlapig and Darwin L. Saludez
Physics Department, Mapua Institute of Technology
Intramuros, Manila

Abstract

Students' expectation in physics as well as teachers' perceptions on what students should expect are very important factors in physics instruction. This paper drew the two groups' expectation and perception using the MPEX Survey. The instrument was given to twenty six architecture students and to five physics teachers in Mapua Institute of Technology. The results showed the big gap of the expectation of students from their teachers and the experts as well.

30.07 **Simple Experiments in Rotational Motion**

PPJ, Vol. 30 (2008), pp. 75-79

Vicenta C. Maxino
Maxino College
Dumaguete City

30.08 **Effects of Copper Content and Pelletizing Pressure on the XRD Patterns of Melt-Quenched Bi 1.6 Pb 0.4 Sr 2 Ca n−1 Cu n O y Ceramics**

PPJ, Vol. 30 (2008), pp. 80-85

Michelle T. Natividad, Shirley T. Palisoc, Ph.D., Ma. Cecilia A. del Mundo
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Abstract

The effects of varying the copper content and pelletizing pressure on the x-ray diffraction (XRD) patterns of super conducting $Bi_{1.6}Pb_{0.4}Sr_2 Ca_{n-1} Cu_nO_y$ ceramics are examined. The samples were fabricated via the melt-quenched method. The copper content with n=3.5 had the highest percentage of the high Tc peaks. The low Tc phase was predominant in all samples. There is no observable trend on the effects of varying the pelletizing pressure on both high Tc and low Tc phases of the samples.

30.09 **The Physics of Blood Flow and Blood Pressure**

PPJ, Vol. 30 (2008), pp. 86-90
Hope M. Bandal, Ph.D[1] and Vanessa M. Bandal[2]
[1] Physics Department, Siliman University
[2] U.P. College of Medicine, 2005

30.10 **Folk Toys in Teaching Fluid Mechanics: Apparatus and Learning Module**

PPJ, Vol. 30 (2008), pp. 91-100
Prof. Perla P. Montealegre
Technological University of the Philippines - Visayas
Talisay City, Negros Occidental

30.11 **PPS MARCH**

30.12 **Philippine Physics Society**
29th Annual National Physics Convention
Fr. Saturnino Urios University
Balanghai Hotel and Convention Center
Butuan City, Caraga Region
April 11-14, 2007
388 Participants

30.13 **Physics Olympics Congress**
La Consolacion College HTM Building
Bacolod City
September 19, 2007
242 Participants

30.14 **Philippine Physics Society**
2007 Luzon Physics Conference Updating and Upgrading Methodology and Content of Physics Teaching
Oct.22-24, 2007
Colegio De San Juan De Letran – Calamba
Calamba City, Laguna 4027
223 Participants

30.15 **Philippine Physics Society**
2008 Regional Physics Olympics Workshop
Maxino College
Bagacay, Dumaguete City
january 26, 2008
134 Participants

Philippine Physics Journal, Vol. 29 (2007)

29.01 **Bioeffects of Ultrasound For Theraphy**
PPJ, Vol. 29 (2007), pp. 1-4
Loreto B. Feril, Jr., Katsuro Tachibana, Kazuki Yamaguchi, Koichi Ogawa, and Hitomi Endo
Department of Anatomy, Fukuoka University School of Medicine, Fukuoka, Japan
ferilism@yahoo.com

29.02 **Characterization of BSCCO Via SEM and Determination of Critical Temperature**
PPJ, Vol. 29 (2007), pp. 5-13
Bobby D. Manlapig and Darwin L. Saludez

Physics Department, Mapua Institute of Technology Intramuros, Manila

Abstract

We characterize a BSCCO high Tc superconductor using SEM and measure the voltage (V) and Resistance (R) as functions temperature. We find that, using SEM, the BSCCO sample manages to display surface characteristics unique to high-Tc superconductors. Furthermore, by characterizing the elements of the superconductor according to activation energy, we find that the graph of the energy as a function of the number of elements present show that the dominant elements present in the sample are those which comprise BSCCO. Finally, by measuring the voltage and resistance as functions of temperature, we find that the behavior of the voltage (and consequently, the resistance) at constant current I conforms to the pattern expected for high-Tc superconductors; that is, a sudden upsurge in the value of V and R at a given temperature, or Tc.

29.03 **A Physics Teacher in Development Work: A Sharing of Experience and Service Learning**

PPJ, Vol. 29 (2007), pp. 14-19

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Head Office for the Social Orientation and Community Involvement Programs [SOCIP]
Mapua Institute of Technology

Abstract

The paper discusses a Physics teacher’s experiences in responding to community needs through the application of Physics principles. It shows that a teacher in Physics neither confines nor interacts solely with the students. It explores the infinite possibilities of doing extracurricular outreach and community development.

Shown here are some of the community outreach projects implemented by the Mapua Institute of Technology through the Office for the Social Orientation and Community Involvement Program [SOCIP]. The Institute has defined its outreach activities as Extensions Service Programs. It aims to alleviate conditions of the community by respond- ing to the community’s needs through technical know-how in the fields of Physics and Engineering.

29.04 **Exploring the Relationship Between Epistemological Beliefs and Achievement in Physics of Engineering Students**

PPJ, Vol. 29 (2007), pp. 20-30

Darwin L. Saludez[1], Bobby D. Manlapig[1], Fe M. Novida[1], May M. Lozada[1], Recardo De Leon[1], and Dr. Ching Ong[2]
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Mapua Institute of Technology
[2] Science Education Department
De La Salle University

Abstract

This paper explores the relationship between the epistemological beliefs of college physics student and their level of academic achievement in college physics subjects. Their epistemological beliefs are determined using EBAPS (Epistemological Beliefs and Achievement of Physics Students), which is a forced-choiced instrument designed to determine student's epistemological beliefs along five learning dimensions. Their level of academic achievement, on the other hand, is determined by computing their quiz scores. Using the Spearsman's Rho correlation test, the researchers find that in general, there is a statistically significant correlation between the student's level of achievement and their epistemological beliefs in physics, not just in terms of the overall EBAPS score also along three of the five learning dimensions. This means that inpresenting a topic in a college physics class, one must take into consideration the student's epistemological beliefs in order to ensure that the students will have a high level academic achievement, which emplies that the student has internalized the lesson effectively. The study also manages to establish a direct link between the epistemological beliefs and level of academic achievement in physics of college physics students. However, the study finds that there seems to be no statistically significant correlation between the student's achievement level in physics and their epistemological beliefs towards the real-life applicability of what they learn in their physics subjects. This finding is suprising in lieu of the fact that there is an overall correlation between the epistemological beliefs and level of academic achievement in physics of college physics students. This suggest a possible new avenue of research, one geared towards exploring the emergence of this result.

29.05 **Physics Portfolio Artifacts: Proofs of the Learners' Higher Order Thingking Skills**

PPJ, Vol. 29 (2007), pp. 31-39

Dr. Renan P. Limjuco
Ateneo de Davao University
C M Recto Avenue, Davao City

29.06 **Engineering Students' and Instructors' View in Physics Using Maryland Physics Expectations Survey (MPEX)**
PPJ, Vol. 29 (2007), pp. 40-49
Darwin L. Saludez and Bobby D. Manlapig
Physcs Department, Mapua Institute of Technology
Intramuros, Manila

29.07 **G-Force Apparatus**
PPJ, Vol. 29 (2007), pp. 50-54
Joel V. Lubrica, PhD
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jlubrica@yahoo.com

29.08 **An Inventory of College Students' Conceptions Related to Heat and Thermodynamics**
PPJ, Vol. 29 (2007), pp. 55-70
Mario P. Obrero, PhD
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Abstract

This study was conducted to determine the correct and prevalent alternative conceptions related to heat and thermodynamics of college physics students. The instrument, entitled "A Concept Inventory for Heat and Thermodynamics," was administered to a sample of second year Engineering students in two state universities in Region I, namely: University of Northern Philippines and Mariano Marcos State University.

Results reveal that college students hold several conceptions regarding heat and thermodynamics. It is suggested that the alternative conceptions be addressed during instruction to ensure a higher student achievement in physics.

The Concept Inventory is recommended for use for instructional and research purposes.

29.09 **Locally-Constructed Solar Water Heater Model: A Preliminary Study**
PPJ, Vol. 29 (2007), pp. 71-79

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6228 Lazi, Siquijor

Abstract

The main concern of this study focused on the construction of a home-made modified Botswana solar water heater model and likewise determined the workability of the modified model since this is the first of its kind of device in the Province of Siquijor specifically at Caguin- hoan, Talayong, Lazi, Siquijor. This model was based on the study conducted at Muchudi, Botswana in 1980. However, it is very feasible to construct.

It was found that there was an increase in temperature when reading was taken at interval of one hour for three (3) days. The data revealed that between 12 noon to 2:00 o'clock in the afternoon, the temperature readings were at their highest points. Moreover, the amount of heat absorbed or lost considerably changed from time to time from 7 o'clock in the morning until 5 o'clock in the afternoon.

It can be concluded that the locally-constructed solar water heater is functional and it is suggested that its performance test will be done as soon as posible so that this device can be introduced to the community for adoption.

29.10 **Electron Microscopy**

PPJ, Vol. 29 (2007), pp. 80-89
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29.11 **Proton Cancer Therapy**

PPJ, Vol. 29 (2007), pp. 90-94
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Abstract

The aim of this article is to provide some introductory knowledge to readers who are familiar with the radiation therapy using X-rays, electrons neutrons, protons, and carbon ions. After tracing the history of the particle therapy including proton therapy, briefly, we concentrate on the principle of the proton therapy, that is, the delivery of a high dose of energy to the tumor while sparing normal tissue around it. Finally, the outline of the planned proton therapy facility of Fukui Prefecture in Japan is presentedas an actual example.

29.12 **Two Non-Prioprietary Softwares in Teaching Astronomy**

PPJ, Vol. 29 (2007), pp. 95-101

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Abstract

Battling the high cost of educational equipment and books, non-prioprietary softwares, like Celestia and Kstars, were created as alternative tools in teaching astronomy. They are used in navigating the non-prioprietary graphical desktop planetarium and virtual space simuations. They are some of the popular and powerful demo engines for classroom use or general illustration of astronomical topics available for free. Kstars is the first presented, followed by Celestia.

29.13 **Thermal Conductivity of Common Insulating Materials**

PPJ, Vol. 29 (2007), pp. 102-108

Hope M. Bandal, PhD and David B. Ragudo
Physics Department, Silliman University
Dumaguete City

29.14 **Specific Heat of Some Construction Materials**

PPJ, Vol. 29 (2007), pp. 109-114

Hope M. Bandal, PhD and Franz Josef I. Crispo
Physics Department, Silliman University
Dumaguete City

29.15 **Some Physical Properties of Local Woods**

PPJ, Vol. 29 (2007), pp. 115-126

Vicenta C. Maxino, PhD
Physics Department, Silliman University
Dumaguete City 6200

29.16 **A Low-Cost Optical Reflection Apparatus**

PPJ, Vol. 29 (2007), pp. 127-139

Gerardo C. Maxino, PhD
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Abstract

Two versions of an inexpensive optical reflection apparatus are presented. Results of test show high acceptability and reability of the apparatus.

29.17 **PPS March**

29.18 **28th NATIONAL PHYSICS CONVENTION SEMINAR-WORKSHOP**
19th NATIONAL PHYSICS OLYMPICS
14th NATINAL PHYSICS FAIR
April 5-9, 2006
Aklan State University Banga, Aklan
412 Participants
217 Schools/Institutions
From Luzon, Visayas , Mindanao

Philippine Physics Journal, Vol. 28 (2006)

28.01 **Light-Emiting Diode (LED) As Wireless Interface**

PPJ, Vol. 28 (2006), pp. 1-4

Engr. Bryanpete R. Tabada, Mast-Physics

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Abstract

Light-Emiting diode (LED) as wireless interface was shown possible, but limited to only a short range of detection about 60 mm. LED could become the cheapest wireless interface but the only disadvantage is its small induced power. A lot of voltage and current amplification that demands large power. In addition, LED cannot detect a light signal from infrared laser, thus, it is a short range interface.

28.02 **The Physics Teacher and the Bicycle**

PPJ, Vol. 28 (2006), pp. 5-10

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Abstract

Inspired by the all-around increase in the number of cyclist on Manila streets and the wave of interest in racing that is sweeping today's youth, we decided to explore a realistic use of bicycles in the physics classroom. Following is a report on what a physics teacher can do with bicycle, a few wires, a computer and few other things.

28.03 **The Physics of Positron Emission Tomography (PET) Imaging: Some Remarks**

PPJ, Vol. 28 (2006), pp. 11-15

Dr. Vicenta C. Maxino
Physics Department, Silliman University
6200 Dumaguete City, Philippines

28.04 **An Easy-to-Construct Loop-the-Loop Apparatus**

PPJ, Vol. 28 (2006), pp. 16-19

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28.05 **Enhancing Learning of Resistors in Series and Parallel Using The Contextual Approach**

PPJ, Vol. 28 (2006), pp. 20-23

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Abstract

One of the latest catchwords in educational circles is constructivism. Learners construct knowledge for themselves, based on what they already know, what they experience, what they believe in, what they fear, and what their prejudices are. In this study, the authors created two learning settings applying some constructivist principles and compared these with the traditional lecture and laboratory platform currently being used. One experimental setting or methodology was totally learner-centered where the students proceeded directly with the learning activity while the teacher acted solely as facilitator and made herself available to clarify questions posed by the students. In the other methodology, a brief lecture is delivered prior to the activity . Otherwise, the two experimental methodologies were almost the same. The results indicate that the students performed best under the contextual learning scheme with a brief lecture preceding the learning activity. Note that in the first experimental setting, the line between lecture and laboratory was erased. In the second experimental setting, lecture is kept to a minimum, not even requiring separate hour. The authors believe that such findings should be reiterated by further data collec- tion in other groups of students and using other topics. These and subsequently results have serious implications on how the separation of physics lecture and laboratory can continue to be practiced and justified.

28.06 **Strategy Mapping with Model Specification: Its Impact on Problem-Solving Skills of the Nursing Students in College Physics in San Juan Pedro College**

PPJ, Vol. 28 (2006), pp. 24-34

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28.07 **Upgrading Electronic Lab With Printed Circuit Board Lay Outing Softwares**

PPJ, Vol. 28 (2006), pp. 35-39

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Abstract

The growing accessibility of interactive computer based interfacing laboratory modules allows faster data acquisition processes which may enhance the learning process. But even if there are many free and readily available schematics, blue prints plans and application programs that can be used to construct interactive computer based interfacing laborator modules, the circuitry involved is still a problem. This paper examines some of the free printed circuit board lay-outing programs that will aid in trouble shooting circuitry and allow a teacher to spend more time on the activity.

28.08 **Measurements of Thermal Properties of Wood Conducted in Philippine School Laboratories**

PPJ, Vol. 28 (2006), pp. 40-46

Liza Marie Tanudra Dangkulos
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Physics Department, Silliman University
6200 Dumaguete City, Philippines

28.09 **What are the Conceptions of Math Major and Non-Math Major Teachers in Mathematics and How Do They Affect Their Practices in Teaching Math**

PPJ, Vol. 28 (2006), pp. 47-53

Bobby D. Manlapig and Darwin L. Saludez
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Mapua Institute of Technology

Abstract

There are evidences that there is a relationship between conceptions

of teachers about the subject they teach and their practices in teaching. This article shows the conceptions and practices of math and non-math major mathematics teachers in college. Six mathematics teachers, 2 math majors and 4 non-math majors, were purposively chosen to be interviewed and one of whose classes was chosen for observation. All of the respondents were master's degree holders. The result shows that math major teachers are more inclined to be student-centered teachers than non-math major teachers. The result shows how the two groups of math teachers differ on their perspective about meaningful learning. Implications of these results are discussed.

28.10 **The Determination By Pulse Height Analysis of The Rate of Penetration of Deposited Radioactive Material in Soil Under Laboratory Conditions**

PPJ, Vol. 28 (2006), pp. 54-66

Annaliza Z. Estrebello and Gerardo Maxino, PhD
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Abstract

The rates of penetration of Potash (K-40) in the 4 different types of 46soil were experimentally determined using pulse height analysis under laboratory conditions. Potash was allowed to penetrate for 5, 10, 15, 20 days. A penetration trend can be seen from the results although a numerical description of the rate of penetration of K-40 in soil was not fully accomplished in this study. The type of soil that permits the fastest penetration was not fully determined. However, it can be concluded that the penetration of K-40 is until the 10 th cm.

28.11 **Ultrasound in Medicine: To Search and Destroy Diseased Tissues**

PPJ, Vol. 28 (2006), pp. 67-72

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7-45-1 Nanakuma, Jonan-ku, Fukuoka 814-0180 Japan
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28.12 **The Resistance of an Ohmic Device: A Pedagogical Plan**

PPJ, Vol. 28 (2006), pp. 73-80

Sharon T. Toledo
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Parañaque City

28.13 **A Comparative Study on Two Teaching Strategies for Enhancing Students' Problem Solving Skills and Conceptual Understanding**

PPJ, Vol. 28 (2006), pp. 81-92
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Abstract

This study focuses on the effect of Orientation, Planning, Action and Checking (OPAC) model of explicit problem solving strategy on student's problem solving skills and conceptual understanding in comparison with that of the traditional method. The study used the non-quivalent pretest and posttest control group design, a quasi-experimental design consisting of an experimental group and a control group, the subjects of which not being randomly assigned. The subjects of this study were two sections of first year students taking up Bachelor of Science in Mechanical Engineering at Palawan State University. The students were enrolled in Physics 2/L a non calculus introductory physics course during the second semester of school year 2003-2004. Student's achievement was measured in terms of their performance scores in a teacher-made test consisting of 20 multiple choice and 5 word items. The results of this study revealed the following: (1) The OPAC model of explicit problem solving strategy used in physics instructions significantly enhanced students' achievement in terms of (a) problem solving skill, (b) conceptual understanding, and (c) prob- lem solving skills and conceptual understanding; (2) Students' problem solving skills significantly correlated with conceptual understanding.

28.14 **Disembedding Abilty, Working Memory Capacity and Problem Solving Approaches of Students**

PPJ, Vol. 28 (2006), pp. 93-98
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Abstract

This qualitative study describes the problem solving approaches used by students of different levels of working memory capacity and disembedding ability in solving two forms of problems in Mechanics. The result of the Digit Backward Test (DBT) and the Find-A-Shape- Puzzle (FASP) were used to identify the levels of working memory capacity and disembedding ability of the students respectively. Students solved four clarification and verification of students' written solutions, the students were individually interviewed after the problem solving session. Results showed that the students of the same as well as of different levels of working memory and disembedding ability used different logical approaches in solving a problem.

28.15 **Geometric Optics in Flash**

PPJ, Vol. 28 (2006), pp. 99-104

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Abstract

While the Microsoft Power Point has long been the software of choice when designing and making presentations due to its availability and ease of use, Multimedia Flash offers a more powerful and flexible alternative. Designed by Macromedia to help provide web designers and programmers the ability to produce low-bandwidth animations and presentations on the Web, Flash can be used to deliver more than what PowerPoint can because of ActionScript, the scripting language that programmers use to tell Flash what to do. In this project, the proponent explored how flash can be used to present and demonstrate the concepts of geometric Optics. The lessons and examples were discussed in slide format just like in PowerPoint with the animation produced using the features of Flash itself as well as ActionScript without resorting to the use of animated clip-art; ActionScript was used to add interactivity to the movie, as well as to produce mini-programs that demonstrate reflection, refraction, and image formation using user-input.

28.16 **Reliabilty and Item Analysis on the Admission Test for the Master of Arts in Physics Program of the University of San Carlos: An Illustrative Case**

PPJ, Vol. 28 (2006), pp. 105-113

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Abstract

This paper illustrate how an admission test may be evaluated. An item Analysis, mainly based on the methodology developed and used in Michigan State University Scoring Office was conducted using the test score results of the 25 student applicants who took the University of San Carlos Master of Arts in Physics (USC-MAP) Admission Test. This study sought to find out the Index of Difficulty and Index of Discrimination of the test items of the said examination. Split Half Reliability Test was employed. On the average the applicants got 54.2% correct answers or an average mean equal to 27.12 of the 50-item test. Based on the applicants' test scores, the average Index of Difficulty and Average Index of Discrimination of the test items were 45.5 and 37.9 respectively.

28.17 **Gamma Spectra of Some Fruits and Vegetables from Mabinay, Oriental Negros**

PPJ, Vol. 28 (2006), pp. 114-124
Anatoly Karpov Pajunar Buss, Ailene Alaban Manso and Gerardo Chua Maxino PhD.
Environmental Radioactivity Research Laboratory
Physics Department, Silliman University
6200 Dumaguete City, Oriental Negros

28.18 **Using Ultrasound for Drug Delivery**

PPJ, Vol. 28 (2006), pp. 125-135
Katsuro Tachibana, MD, PhD and Loreto B. Feril, Jr., MD,PhD
Department of Anatomy, Fukuoka University School of Medicine
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k-tachi@cis.fukuoka-u.ac.jp

28.19 **The Phyton Language: An Overview**

PPJ, Vol. 28 (2006), pp. 136-142
Rogel Arnel C. Lusares
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28.20 **Vicente Guzman Sinco: His Thoughts on Research, Science and Education**
PPJ, Vol. 28 (2006), pp. 143-148
Dr. Thelma M. Bueno
Silliman University
6200 Dumaguete City

28.21 **Measuring Planck's Constant h with Student-Made Apparatus**
PPJ, Vol. 28 (2006), pp. 149-152
Gerardo C. Maxino, Virginia D. Tubio Jr., Anilyn L. Acosta, Franz Josef I. Crispo, Blesilda V. Esterioso, and David B. Ragudo
Silliman University
6200 Dumaguete City

28.22 **2005 Philippine Physics Society Luzon Conference**
October 21-22, 2005
Technological University of the Philippines
Ayala Blvd., Ermita, Manila 1000
166 Participants
104 Schools/ Institutions

28.23 **Philippine Physics Society**
27th Annual National Seminar/Workshop – Convention
April 6-9, 2005
University of Baguio
Baguio City
366 Participants
227 Schools/ Institutions

28.24 **National Seminar-Workshop on Non-Proprietary Software**
January 27-28, 2006
Physics Department, Silliman University
Dumaguete City
15 Participants

28.25 **Seminar on Open Source and Science Education**
February 18, 2006
Physics Department, Silliman University
Dumaguete City
Lecturer: Dominique Gerald Cimafranca
Member, Board of Directors
Philippine Linux User's Group, Inc
8 Participants

28.26 **Regional Seminar-Workshop in Physics**
July 29-30, 2005
Aklan State University
Banga, Aklan
68 Participants

28.27 PPS MARCH

Philippine Physics Journal, Vol. 27 (2005)

27.01 **Magnetism and Faraday's Law**
PPJ, Vol. 27 (2005), pp. 1-12
Francisco Glover, S.J.
Ateneo de Davao University
Davao City

27.02 **New Instruments for a Student Laboratory in Intermediate Electronics**
PPJ, Vol. 27 (2005), pp. 13-26
Engr. Rafael U. Gaid, E.C.E. Francisco Glover, PhD & Engr. Reymann M. Zamora, E.C.E.
Ateneo de Davao University
Davao City

27.03 **T-Test Analysis of the Effect of Mental Fatigue on the Reaction Time to Sound and Light Using DataStudio**

PPJ, Vol. 27 (2005), pp. 27-35

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Abstract

Computer based tests were conducted to determine the effect of mental fatigue on the reaction time to sound and light using DataStudio. A random sample of 30 volunteer subjects was tested on two different occasions: after an exam and during their free time. These corresponded to their mentally fatigued and nonmentally fatigued states. Results from the experiment show that, comparing between the two stimuli, sound and light, the overall mean reaction time to sound is significantly faster than the reaction time to light. Results from the experiments also show that the average reaction time to sound is not significantly slower when mentally fatigued than when not mentally fatigued. The same is the case for light the average reaction time to light is not significantly slower when mentally fatigued.

27.04 **The Effect of Human Motion Graph Activity on Students' Motion Graph Interpretation Skills**

PPJ, Vol. 27 (2005), pp. 36-46

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Abstract

The effect of the human motion graph activity on students' graph interpretation skills in kinematics was investigated. Forty students enrolled in College Physics 1 (Laboratory) at the Mapua Institute of Technology participated in this study. The results in the pretest showed that the students' ability to interpret motion graphs were low. The human motion graph activity helped the students to overcome some of their difficulties; however, since the students were exposed only to one MBL activty, there were still pertinent difficulties that remained.

27.05 **Improvements on the PC Interfaced Acceleration Measuring Device for Physics Laboratory Experiments**

PPJ, Vol. 27 (2005), pp. 47-51

Srilan Maranan[1], Kristine Villamor[1], Carlito S. Ponseca Jr.[1] and Anthony R. Cabrera[2]
[1] School of EE-ECE-CoE, Mapua Institute of Technology
Intramuros, Manila
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Abstract

Automated data acquisition circuits have been described using the parallel port of a computer through Visual C++. This is part of a continuous effort to produce low cost laboratory apparatus that are both accurate and easy to use. Two versions of an accelerometer device are described in this paper. Each prototype determined sources of errors (initial moment of inertia, device delay, code optimization) that were used in improving the design for the next version. For the first revision, errors of 13.63% and 16.38% between the experimental and theoretical values were recorded while the second revision showed errors of 12.58% and 7.20% on two different angles. The next revision of the prototype will include the use of embedded assembly code in the Visual C++ code together with advanced thread synchronization techniques to improve the accuracy of the measured data.

27.06 **Implementation of a Microcontroller Circuit Board for General Engineering Physics Laboratory Experiments**

PPJ, Vol. 27 (2005), pp. 52-56

Ednel Crisostomo, Oliver Viloan, Fatima Donayre, Resty O. Damian and Carlito S. Ponseca Jr.
Mapua Institute of Technology
Intramuros, Manila

Abstract

We have previously demonstrated several automated data acquisition circuits that have utilized microcontroller to process the acquired physical parameters and display it with a read out circuit. Among these are: a temperature sensing device, an acceleration measurement device, a circuit that measures the period of oscillation of simple pendulum and spring and a circuit that measures a time of flight of a body in a trajectory path. Through these devices, we were able to show that

classroom experiments were not as expensive as compared to commercially available apparatus. However, each circuit was implemented separately. In this paper, we present a circuit where the enumerated laboratory experiments can be performed using a single circuit board. Results showed a small percentage error of the gathered data when compared to its theoretical value.

27.07 **UV Fluorescence Imaging of Vinblastine-4'-Anthranilate Distribution on Root Samples of Two Variants (Red Flower and White Flower) of *Catharanthus Roseus (C. Roseus)***

PPJ, Vol. 27 (2005), pp. 57-61

Jonathan D. Galingan, Franz Josef S. Benjamin and Romeric F. Pobre
Medical Physics Instrumentation Laboratory
Physics Department, De La Salle University-Manila

Abstract

Images of the vinblastine-4'-anthranilate distribution on root samples of two variants (red flower and white flower) of C. roseus or Tsitsirika were obtained using an epi-fluorescence microscope (Olympus BX-51). Vinblastine-4'-anthranilate is a fluorescent under UV radiation with excitation and emission wavelengths of 330 nm and 441 nm, respectively. Twenty-five (25) different root samples for each variant were prepared which were laterally sectioned for larger image area. The root samples were placed on glass slide and imaged on the stage of the epifluorescence microscope. Images recorded by a sensitive CCD camera (Olympus DP-12) mounted on the trinocular port were processed 54in a desktop PC using Adobe Photoshop ver. 7.0 application program to calculate the histogram of the fluorescence image of vinblastine-4'-anthranilate. Keeping the optical settings of the microscope constant, t-test analysis of the mean luminosity showed that the active fluorescent chemical (vinblastine-4'-anthranilate) was more apparent on the red variety than on the white variety of C.roseus.

27.08 **The Effect of Light and Temperature on Ecological Balance Between an Elodea Nattallii and Carassius Auratus in a Closed Environment Using Data Studio**

PPJ, Vol. 27 (2005), pp. 62-68

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Abstract

Ecological balance is the interactions of different organisms along with the environment, which is in a state of equilibrium. Small closed systems are efficient models in determining certain ecological factors for simulation. Closed systems were constructed using a beaker and stirrer to observe the presence of the balance and perform real time measurements on an aquatic system. The study presented a real time computer based experiment on the effect of light and temperature on the ecological balance between and Elodea Nattallii (aquatic plant) and a Carassius Auratus (goldfish) fish specimen. Thirty samples were conducted based on the following parameters, fish-to-fish with no light exposure and fish to plant with exposure to light. Results revealed on the fish-to-fish interaction with no light exposure exhibited a decrease in the pH values that can be attributed on the increase of carbon brought about by the interaction. However, results on the fish to plant interac- tion showed a minimal variation in the pH values which simply means that the interactions between light, fish, and plant were ecologically balanced.

27.09 **Physics Project Integration Visualization Tool (PIVit)**

PPJ, Vol. 27 (2005), pp. 69-73

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Abstract

Designing projects and conducting research is a tedious job. However, tools like the Project Integration Visualization Tool (PIVit) software provide an environment that aids teachers as well as students to process their projects, activities, investigations, artifacts, and curricular objectives. This paper presents how PIVit can assist teachers and students in developing their projects as well as in sharing their ideas, projects, and planning with colleagues.

27.10 **The Patterns Sketched from the Simultaneous Oscillations Occuring Along the X and Y Axes (The Computer Simulation Method of Determining Lissajous Figures)**

PPJ, Vol. 27 (2005), pp. 74-77

Armien John Samson
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Abstract

A detailed analysis on the patterns sketched by taking into account simultaneous oscillations along x and y axes is being presented in this paper. A better understanding of this important phenomenon called Lissajous Patterns is best described by varying its controlling perimeter values and through the aid of numerical analysis. Two sets of graphical presentation have been done here. One is of the Cartesian coordinate system and the other polar.

27.11 **Sample Micrographs of Grown Indium Nitride (InN) by Metal Organic Chemical Vapor Deposition (MOCVD)**

PPJ, Vol. 27 (2005), pp. 78-83

Carlito S. Ponseca, Jr.
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Mapua Institute of Technology
Intramuros, Manila

Abstract

In this paper, the author presents sample micrographs of grown InN by metal organic chemical vapor deposition (MOCVD). The InN thin film was deposited on top of aluminum nitride (AlN) / sapphire (α-Al_2O_3) system at a controlled temperature, pressure, and mass flow rate. Scanning electron microscope (SEM) micrographs revealed formation of hexagonal islands throughout the sample which has the same structure as the theoretical struture of InN. When the cross section of the samples was investigated, crystallites were seen to be randomly distributed while its orientation has no specific pattern. It is believed that the rate of flow of the trimethylindium (TMI) influences this structural formation.

27.12 **A Simple Experiment for Measuring Minority Carrier Life-time**

PPJ, Vol. 27 (2005), pp. 84-87

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Abstract

The minority carrier lifetime of a sample germanium was measured

by observing the decay of its conductivity after an initial photoexcitation. The measurements were done under different applied voltages across the sample. The characteristic exponential decay curve was observed in all cases. The time constant of the exponential curves represent the minority carrier lifetime of the sample. Results obtained were in the range 0.47–.57 ms, depending on the applied voltage.

27.13 **Inexpensive Photodetector Using Light-Emiting Diode (LED)**

PPJ, Vol. 27 (2005), pp. 88-92

Engr. Bryanpete R. Tabada
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Abstract

This study aimed at putting up an inexpensive photodetector by the use of a light-emitting diode (LED). It investigates further which among the three LED detectors could induce voltage best.

In terms of the distance between the light source and the induced voltage, the data revealed their inverse relationship. The farther the receiver, the smaller the induced voltage; and the nearer the receiver, the larger the voltage induced. This proves Einstein's theory of photoelectric effect that the more photons received, the greater the electrons per second will be knocking out of the surface. It is recommended that the use of light-emitting diode, particularly the green Transparent LED for use as a receiving element or detector in a communicator circuit.

27.14 **Effects of the Partial Substitution of Tin (Sn) into the Strontium (Sr) Site of the High-Tc BSCCO System**

PPJ, Vol. 27 (2005), pp. 83-96

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Abstract

The effects of the partial substitution of Tin (Sn) into Strontium (Sr) site of the high-Tc and Low -Tc BSCCO system is studied. X- ray diffraction analysis revealed the co-existence of the high- Tc and low- Tc phases in the most of the samples. Electrical resistivity measurements showed zero resistivity at 115 K for the sample prepared via solid-state reaction method and with nominal composition of Bi_2 $(Sr_{1.7}Sn_{0.3})$ $Ca_2Cu_3O_{16}$. Susceptibility measurement of this sample showed a transition onset of about 112 K. SEM analysis of this sample revealed that bar shaped crystals were formed.

27.15 **Application of Program Evaluation and Review Technique/ Critical Path Method to the Management of Physics Projects**

PPJ, Vol. 27 (2005), pp. 97-103

Dr. Thelma M. Bueno
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27.16 **Development and Validation of an Interactive Mechanics Visualization Software for Vector Addition, Subtraction, and Multiplication Using Python**

PPJ, Vol. 27 (2005), pp. 104-111

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Intramuros, Manila

Abstract

Interactive visualization software in vector addition, subtraction and multiplication was developed and validated. The language used is that of python which is a free downloadable program from the internet. The interactive software was validated by both experts and students at α=0.05 using two tailed t-test. The interactive software was also tested on the student's performance. Students who were exposed to the interactive software obtained higher test scores than those students who used chalk and board method only. This was validated by a two tailed t-test at α =0.05. It shows that there is a significant difference between the performance of

students using the interactive software and those who were not using the interactive software.

27.17 **Students' Problem Solving Performance, Working Memory Capacity, and Disembedding Ability**

PPJ, Vol. 27 (2005), pp. 112-117

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Abstract

This qualitative study determines the performance of students of different levels of working memory and disembedding ability in solving two forms of problems in Mechanics particularly in dynamics. The working memory capacity and disembedding ability of the students were determined. Results showed that the extremes of performance in both forms of problems occurred between field independent student with high working memory capacity and field dependent student with low working memory capacity. Students of low working memory capacity but of high disembedding ability obtained higher scores in the two forms of the problem than the students of high working memory capacity but of low disembedding ability. Thus, working memory capacity and disembedding ability are significant fcators in influencing performance of students.

27.18 **Achievement of Environmental Education-Related Competencies in Science: A Rasch Analysis**

PPJ, Vol. 27 (2005), pp. 118-132

Joel V. Lubrica Ph.D
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Abstract

This study dealt with views of teachers on the integration of of environmental education with secondary school science. In particular, the achievement of environmental education related competencies in secondary school science was considered. The investigation involved 73 teachers who responded to questionnaires. All of the respondents were from Benguet Division of Department of Education in Northern Luzon. Questionnaire data were analyzed using Rasch analysis. Qualitative data were subjected to

content analysis.

Results indicated that teachers perceived that the level of achievement by students of environmental education-related competencies through science classes was high. Moreover, an application-related competency was perceived to be more difficult to achieve than explanation or demonstration-related ones. Implications of results to the school implementation of environmental education and to the enhancement of the relevance of school science are presented. A future research initiative is identified.

27.19 **Improvised Cardboard Ramps: Experiments in Kinematics, Projectile Motion, and Momentum**

PPJ, Vol. 27 (2005), pp. 133-146

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27.20 **Misconceptions in Mechanics Focusing on Force and Motion**

PPJ, Vol. 27 (2005), pp. 147-163

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Abstract

The great majority of tertiary students at Siquijor State College do not understand and apply the Newtonian Point of View. Instead Newton's Laws of Motion became the Students Law of Force and Motion. The students are prone to misinterpreting almost everything they see and hear in physics class.

27.21 **Development of a Facility for Growing Thin Films by Pulsed Laser Deposition Technique**

PPJ, Vol. 27 (2005), pp. 164-171

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Abstract

A facility was developed to grow thin films using Pulsed Nd-YAG laser. A glass diffusion pump was utilized and connected to a glass bell jar at low vacuum pressure .MgB 2 powder sample was pelletized and placed in a target holder inside the glass bell jar oriented at 42 degrees with respect to the target holder. A silicon film was used as a substrate that was attached to a glass slide with a distance of 2.0 and 3.5 cm with respect to the target. A laser power of 5.20 to 5.30 watts was utilized to ablate the MgB 2 sample with 1064 nm wavelength at a pulse rate of 20 Hz. The deposition rate was varied at a low vacuum pressure. Results from the SEM showed that the presence of grains in the silicon substrate that are similar compared to literature. The study also focused on the importance of height when depositing the MgB 2 target. As the deposition height increases, the grain size also increases. Deposition height is also an important factor in film adhesion of the MgB 2 sample. The energy spectrum of the MgB 2 thin film exhibited the presence of magnesium while that of boron is minimal since the latter is a light material. The presence of other peaks could be attributed to the silicon substrate and oxygen since the thin film has an MgO trace element, observed in the SEM as white particles. From the XRD, as the deposition time increases, the XRD peak intensity also increases. Moreover, as the deposition height decreases, The XRD peakintensity increases.

27.22 **Literacy and Development: A Look at Some Hard Data**

PPJ, Vol. 27 (2005), pp. 172-183

Dr. Thelma M. Bueno
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27.23 **Determination of Mechanical Equivalent of Heat (J) Using Scrap Materials**

PPJ, Vol. 27 (2005), pp. 184-192

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Abstract

The main concern of this study is the determination of the mechanical equivalent of heat (J) using an improvised apparatus made from

PVC tube and scrap metal (aluminum and lead) shots. The study also focuses on the appeal or presentation, ease in handling and accuracy/reliability of the apparatus as a good substitute for an expensive commercially manufactured one.

By performing a number of trials using the two metals (300g of aluminum and 300g of lead) in the two PVC tubes of effective lengths 80 cm and 90 cm respectively, the following observations were made. The longer PVC tube acquired the best results as compared to the shorter one due to the higher amount of potential energy that served as the amount of work done by falling metal shots. The 300g lead metal slots provided the reasonable results for the reason that it is of lower specific heat (c=0.031ca/g.C ◦), which allowed the metal to acquire the considerable change in its temperature.

In as much as the materials needed are produced locally, the improvised apparatus can easily be produced at a relatively lower cost. This apparatus could even be used for demonstration in lecture classes.

27.24 **Coefficients of Thermal Conductivity of Some Philippine Woods**

PPJ, Vol. 27 (2005), pp. 193-199

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Abstract

The coefficients of thermal conductivity of 12 different kinds of Philippine woods were experimentally determined, both for heat flowing parallel to the grain and for heat flowing perpendicular to the grain.

For the heat flowing across the grain, the values of the coefficients of thermal conductivity k ranges from 1.37 x 10^{-4} cal/(cm.s.C$^{\circ}$) for Caimito to 2.47 x 10^{-4} cal/(cm.s.C$^{\circ}$) for Gimelina.

For heat flowing along the grain, the values of the coefficient of thermal conductivity k ranges from 2.44 x 10^{-4} cal/(cm.s.C$^{\circ}$) for Nangka to 5.10 x 10^{-4} cal/(cm.s.C$^{\circ}$) for Mango.

Within each set of trials, the deviations of individual values from the average value are small.

An examination with available literature indicates that the values obtained are, at least, fairly accurate.

27.25 **Estimating the Power of the Sun**

PPJ, Vol. 27 (2005), pp. 200-201
Dick Hoekzema en Ed van den Berg
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Utrecht, Netherlands

27.26 **Measuring the Light Absorption Coefficient of Some Locally Available Leaves**
PPJ, Vol. 27 (2005), pp. 202-210
Vicenta C. Maxino and Ryan S. Locsin
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Silliman University
Dumaguete City

27.27 **Specific Heat of Sand in Negros Oriental and Zamboanga Del Norte**
PPJ, Vol. 27 (2005), pp. 202-210
Hope M. Bandal, Ph.D. and Rhodora I. Villagracia
Physics Department, Silliman University
Dumaguete City

27.28 **Graph and Drafting of a Source and a Sink Approaching One Another Producing the Pattern of a Doublet Using Numerical Analysis (A Computer Simulation Showing the Pattern of a Doublet)**
PPJ, Vol. 27 (2005), pp. 211-214
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College of Natural Sciences and Mathematics
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Abstract
This study is focused on the formation of the pattern of a doublet functions i.e the stream function and velocity potential function, and the doublet velocity is made using the Runge-Kutta method. The relationships between the stream and velocity and theta are drafted in polar and Cartesian Coordinates.

27.29 **26th National Physics Convention and Seminar Workshop**
17th National Physics Olympics
12th National Physics Fair
April 1-4, 2004
Ateneo De Davao University
Davao City 8000
448 Participants
212 Schools/Institutions
From Luzon Visayas Mindanao

27.30 **Regional Seminar-Workshop on the Teaching of the Special Theory of Relativity, Photoelectric Effect and Brownian Motion: A Remembrance of Albert Eintein's Wondrous Outburst of Creativity (1905-2005)**
January 13, 2005
Silliman University
Dumaguete City
20 Participants

Philippine Physics Journal, Vol. 26 (2004)

26.01 **Fabrication and Testing of Meh-PPV Thin Semiconducting Film as Potential Substrate for Optical Waveguide**
PPJ, Vol. 26 (2004), pp. 1-6
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[b] ECE Department, College of Engineering
De La Salle University
[c] Department of Physics, School of Science and Engineering
Ateneo De Manila University
Abstract

In this paper, which extends a previous study [10] by attenuation measurements, we report the preliminary results on the fabrication and testing of poly[2-methoxy-5-(2'ethylhexyloxy)-1,4] phenylenevinylene

(MEH-PPV) thin semiconducting film as possible substrate ma- terial for optical waveguide. The polymer was deposited onto low index of refraction (n=1.34) magnesium fluoride (MgF_2) coated on a base made of glass (SiO_2). A relatively uniform film of MEH-PPV on MgF_2/SiO_2 was obtained by spin-coating the polymer solution. The MEH-PPV/MgF_2/SiO_2 layers show spectra with high transmittance in the region between 300-800 nm. The absorbance spectrum of MEH- PPV show marked peak at low value of wavelengths, which agrees with the literature. A dual laser source (Fabry-Perot LD) was used to measure the attenuation of the waveguide using an optical power meter. Results have shown that the mean attenuation of the polymer is 2.142 dB at 1310 nm and 0.439 dB at 1550 nm.

26.02 **The Metacognitive Behaviors of High-Performing and Low-Performing Engineering Students in Solving Physics Problems**

PPJ, Vol. 26 (2004), pp. 6-13

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Abstract

Physics requires higher thinking skills and strategies in order for students to understand its concepts and solve challenge problems. One way to develop these skills and strategies necessary for learning physics is to activate student's metacognition. This study examined metacognitive strategies and behaviors that contributed to problem solving succcess or failure of engineering students. A Physics Metacognitive Problem Solving Assessment Sheet and a Systematic Metacognitive Worksheet were used to evaluate the different metacognitive strategies employed by the students. The result of this particular research indicated the need for metacognitive behaviors to become successful in Physics problem solving.

20.03 **A PC-Based Stress-Strain Apparatus for Classroom Demonstration**

PPJ, Vol. 26 (2004), pp. 14-18

J. Canales, E. Flores, and G. N. C. Santos
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Abstract

A computer interface stress-strain apparatus was used to generate the stress-strain curves of different materials. The set-up stretches a test coupon while it measures and displays on the computer screen the amount of force and stretch experienced in real time.

26.04 **Automation of Data Acquisition for Selected Physics Laboratory Experiments by PC Interface Using Parallel Port**

PJ, Vol. 26 (2004), pp. 19-22

Lester Vil Q. Artificio[a], Carlito S. Ponseca, Jr[a]., Joyrence Mervin Q. Agas[a] and Anthony R Cabrera[b]

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Mapua Institute of Technology

[b] Microelectronics Division
Advanced Science and Technology Institute

Abstract

In this paper, we describe the initial implementations of hardware interfacing through Visual C++. The designed circuits are mainly composed of sensors, amplifiers and analog to digital converters (ADCs) to produce the needed digital signal. They are read through the parallel port and converted to a human-readable format through graphical user interface (GUI). Two experiments are described: a temperature sensing device that monitors the temperature and acceleration measurement device that calculates acceleration of an object by getting the time elapsed between four points. An average error of ±1 °C on the reading of the temperature monitor was recorded throughout the experiment. Also, the accelerometer's Light Dependent Resistor (LDR) is suspected to have introduced the delay in the system.

26.05 **Construction of an Improvised Apparatus for Determination of Permittivity of Free Space**

PPJ, Vol. 26 (2004), pp. 23-25

Julia G. Cuan
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Mapua Institute of Tecnology
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Abstract

The study aims to develop and construct an improvised apparatus used to measure the permittivity of free space ε_0, which is a fundamental

constant in the field of electrostatics. Apparently, the results of the experiments performed showed that the constant 0 obtained using the improvised apparatus had a low percentage error.

26.06 **Electronic Temperature Monitoring Circuit as Substitutes to Conventional Thermometers**

PPJ, Vol. 26 (2004), pp. 26-30

Joyrence Mervin Q. Agas[a], Lester Vil. Arificio[b], Marco Ruel P. Manzanilla[b], Michael C. Pacis[b] and Carlito S. Ponseca,Jr[b].
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Mapua Institute of Tecnology

Abstract

This project designs and tests an electronic circuit that will be used to substitute conventional thermometers. Testing of the designed circuit involves comparison of data read from the thermocouple and that displayed by the circuit. Data have shown that the thermocouple is more sensitive to change in temperature than the designed circuit. Statistical analysis revealed that there is a strong correlation between readings of the circuit and the thermocouple.

26.07 **Determination of the Coefficient of Linear Expansion of Selected Philippine Woods Measured Across the Grain**

PPJ, Vol. 26 (2004), pp. 31-33

Darwin L. Saludez[a], Bobby D. Manlapig[b] and Carlito S. Ponseca, Jr[a].
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Mapua Institute of Technology
[b] Electronics and Communication Engineering Department; School of EE-ECE-CoE
Mapua Institute of Technology

Abstract

This study determined the coefficient of linear expansion of three selected Philippine hardwood; namely, Tanguile, Mulawin, and Narra, measured across the grain. Statistical analysis of the gathered data, tested at 0.05 level of significance, showed that Mulawin's coefficient of linear expansion is between 2.8218×10^{-5} /C° and 4.1742×10^{-5} /C° while Narra's

cofficient of linear expansion is between 2.8108 x 10^{-5} /C°and 5.3924 x 10^{-5} /C° . On the other hand, the computed coefficient of linear expansion for Tanguile is inconclusive since its standard deviation is too variable.

26.08 **Proficiency of Physics Teachers in Scientific Calculations: A Study Report**

PPJ, Vol. 26 (2004), pp. 34-41

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Abstract

This study is designed to determine the proficiency level as well as the significant improvement from the pre-test to the post-test of the Physics teachers in scientific calculations as bases for curricular offerings.

The data revealed that the proficiency level of the Physics teachers in scientific calculations in the pre-test was poor and average in the post-test. It further showed that there was a significant improvement from the pre-test to the post-test scores of the Physics teachers after an intervention was introduced.

26.09 **Orchestrating Physics Classes with Anvil Studio T M**

PPJ, Vol. 26 (2004), pp. 41-46

Julius M. Jose
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San Aurelio 2442, Balungao, Pangasinan
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Abstract

Sound is too abstract for students unless they can appreciate it. One way of simulating students to learn about sound waves is by allowing them to explore this phenomenon through playing a musical instrument. However, only a few know how to play at least one instrument. But with Anvil Studio they can be composers; they can play band or an orchestra or be sound engineers at the same time. Surprisingly with zero price tag, Anvil Studio is an outstanding tool with regards to sound manipulation.

26.10 **Measuring Sound Transmission Intensities of Some Local Materials**

PPJ, Vol. 26 (2004), pp. 47-60
Vicenta C. Maxino and Michelle Nena G. Nuñez
Acoustics and Material Properties Research Laboratory
Silliman University
Dumaguete City

26.11 **A Low-Cost, Versatile Linear Airtrack**

PPJ, Vol. 26 (2004), pp. 61-66
Francisco G. Glover, S.J., Ph.D
Ateneo de Davao University
Davao City

26.12 **Improving Problem Solving Skills in Physics using Model Specification in Strategy Mapping**

PPJ, Vol. 26 (2004), pp. 67-78
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Abstract

Students in introductory physics approach problem solving in a formulaic manner. They believe that the analysis of a physical situation simply consist of procedural and routine elements that include diagrams, labeled arrows, and derived equations. These learners have adopted these problem solving strategies through their teachers who probably concur to the idea that rote method of analysis is adequate for a lot of physics problems. However, recent studies show that under this conventional instruction, students easily get confused because the procedural knowledge from the textbook does not totally address the naive beliefs and misconceptions of the students regarding the basic idea of physics. There is a suggestion that mathematical modeling might improve significant physics instruction.

This paper discusses the application of the modeling theory of physics instruction as advanced by David Hestenes on problem solving in introductory physics course. Specifically, it shows how the model specification in strategy mapping can facilitate the analytical and evaluate skills of the students in problem solving. Discussed in the material are the dimensions of modeling-decontextualized physics situation, situation map, motion map, force map, equations, and interaction laws or functions. Also

included in the report is the suggested methodology for the classroom use of the modeling theory via model specification embedded in the strategy mapping.

26.13 **A Method of Measuring The Sound Level of Machine Noise**

PPJ, Vol. 26 (2004), pp. 79-89

Hope M. Bandal, Ph.D
Physics Department
Silliman University
Dumaguete City

26.14 **Gamma Absorption Coefficients of Some Philippine Hardwoods**

PPJ, Vol. 26 (2004), pp. 90-102

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Dumaguete City 6200

Abstract

With the use of pulse-height analysis, the gamma linear and mass absorption coefficient of 11 Philippine hardwoods were determined for gamma energy of 0.662 Mev from Cs 137 . The values obtained ranged from 0.043 per cm to 0.094 per cm for the linear absorption coefficients and 0.093 cm 2 /g to 0.15 cm 2 /g for the mass absorption coefficients.

26.15 **25th National Physics Convention and Seminar-Workshop**
16th National Physics Olympics
11th National Physics Fair

April 2-5, 2003
Samar State Polytechnic College
Catbalogan, Samar 6700
375 Participants
From Luzon, Visayas and Mindanao

26.16 **2003 Philippine Physics Society Luzon Conference**

October 3-4, 2003
Mapua Institute of Technology

Intramuros, Metro Manila
194 Participants

26.17 **2nd PPS-Siquijor Chapter Regional Seminar-Workshop on Inexpensive Physics Laboratory Instrumentation**
August 15-16, 2003
Siquijor State College
Larena, Siquijor
99 Participants

Philippine Physics Journal, Vol. 25 (2003)

25.01 **Student Experiment to Plot Magnetic Field Intensity**
PPJ, Vol. 25 (2003), pp. 1-5
Francisco Glover, SJ and Kristine Rodriguez
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Abstract

Details of a college-level student laboratory experiment to measure the magnetic field intensity normal to the plane of a rectangular loop current are described. Based on the Biot-Savart law, a general expression is derived for the loop field intensity at any point in the plane, within or outside a rectangular loop centered at the origin. Values are normalized in terms of a value of 100 units at the origin. In the experimental apparatus, an alternating current is passed through a multiturn rectangular loop. The resulting voltage induced in a small movable search coil is measured. This is proportional to the magnetic field intensity at the point. Field intensity contours are easily plotted.

25.01 **Professional Advancement of Tertiary Physics Teachers in Central Visayas, 1989 – 1999**
PPJ, Vol. 25 (2003), pp. 6-14
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6200 Cebu City

25.03 **Free Wheel Racing**

PPJ, Vol. 25 (2003), pp. 15-20
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Abstract

The dynamics of combined translation and rotation of rigid bodies can be demonstrated using simple carts and wheels rolling freely on an inclined plane. Effects of different parameters are presented with thorough analysis and mathematical formulations. Variations in a demonstration can be made to illuminate the key features of its mechanics.

25.04 **Axon2003 Idea Processor for Physics Education**

PPJ, Vol. 25 (2003), pp. 21-25
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Abstract

Education research during the 1960's had brought about the development of teaching strategies such as concept mapping. Concept mapping brought a twist to the traditional numerical side of Physics to a more conceptual way, as an introduction to its mathematical foundation. And now recent development and integration of ITC in education make the technique easier to use with a click of a mouse. This paper will discuss the features and strategies for using AXON2003 software for physics. This will include benefits such as creation of concept maps and outlining and presenting students' ideas and concepts.

25.05 **The Measurement of Planck's Constant h with Phototubes, LED's, and Light Bulbs: A Brief and Partial Survey**

PPJ, Vol. 25 (2003), pp. 26-39
Josh Emmanuel C. Alquiza
Instructional Physics Toys Research Laboratory
Physics Department, Silliman University
6200 Dumaguete City

25.06 **The Determination of Plank's Constant h with an Inexpensive, Self-Made Apparatus**
PPJ, Vol. 25 (2003), pp. 40-45
Josh Emmanuel C. Alquiza and Gerardo Maxino, Ph.D
Instructional Physics Toys Research Laboratory
Physics Department, Silliman University
6200 Dumaguete City

25.07 **Common Errors and Misconceptions in Basic Mathematics**
PPJ, Vol. 25 (2003), pp. 46-56
Ed van den Berg, Ph.D
Centre for International Cooperation, Vrije Universiteit
De Boelelaan 1105, 1081 HV Amsterdam, Netherlands
edberg51@planet.nl

25.08 **The Use of Rubrics Method in Teaching Physics***
PPJ, Vol. 25 (2003), pp. 57-70
Roel D. Taroc [a] , MAST Physics and Gil Nonato C. Santos [b] , MS Physics
[a] Siquijor State College
6226 Larena Siquijor
wingroe@netscape.net
[b] De La Salle University
2401 Taft Avenue, Manila
cosgncs@mail.dlsu.edu.ph

25.09 **Radioactive Decay: A Laboratory Simulation with Drinking Straws**
PPJ, Vol. 25 (2003), pp. 71-81
Gerardo C. Maxino Ph.D
Environmental Radioactivity Research Laboratory
Physics Department, Silliman University

6200 Dumaguete City

25.10 **24th National Physics Convention and Seminar-Workshop**
15th PPS National Physics Olympics
10th National Physics Fair
April 3-6, 2002
Silliman University
Dumaguete City
472 Participants
From Luzon, Visayas and Mindanao

25.11 **Regional Seminar-Workshop on Teaching Optics, Electricity and Nuclear Physics**
August 16-17, 2002
Siquijor State College
Larena, Siquijor 6226
177 Participants

25.12 **Philippine Physics Society Seminar-Workshop**
October 21-22, 2002
Adamson University
Ermita, Manila
150 Participants

25.13 **First Diocesan Physics Seminar-Workshop on Electricity and Electronics**
November 15, 2002
Immaculate Heart Academy
Tanjay City, Negros Oriental 6204
66 Participants

Philippine Physics Journal, Vol. 24 (2002)

Environmental Radioactivity Research Laboratory
Physics Department, Silliman University
Dumaguete City

24.06 **Computer-Based Sound Transmission Measurements**

PPJ, Vol. 24 (2002), pp. 41-51
Dr. Vicenta C. Maxino
Physics Department, Silliman University
6200 Dumaguete City, Philippines

24.07 **Environmental Radioactivity Measurements in Negros Oriental, 1981-1998: A Brief and Partial Survey**

PPJ, Vol. 24 (2002), pp. 52-59
Anatoly Karpov P. Buss
Environmental Radioactivity Research Laboratory
Physics Department, Silliman University
Dumaguete City

24.08 **Some Inexpensive, Improvised Physics Apparatus for Class Demonstration or Experiment**

PPJ, Vol. 24 (2002), pp. 60-66
Hope M. Bandal Ph D
Physics Department
Silliman University
Dumaguete City

7624.09 **Concept Maps and Student Performance**

PPJ, Vol. 24 (2002), pp. 67-80
Julius M. Jose
San Aurelio National High School
San Aurelio, Balungao
Pangasinan 2442

Abstract

This study was designed to determine the relationship between the use of concept mapping and the performance of students in Science and Technology IV (Physics) .

The result of the study indicates a positive relationship between the

use of concept mapping and student performance and implies that concept mapping is an effective strategy in teaching Science and Technology IV in important cognitive areas of knowledge, application, analysis, and synthesis.

24.10 **Investigative Sound Analyses and Sound Level Survey on Ambient Noise of Cebu Private Power Corporation at Barangay Ermita, Cebu City**
PPJ, Vol. 24 (2002), pp. 81-89
Helena de los Reyes MS Physics, Cherlie O. Yap MS Physics, Antonio Mayo MA and Fr. Herman van Engelen, Ph.D., SVD
University of San Carlos
6000 Cebu City

24.11 **Ambient Gamma Measurements and Radiation Maps in Central Visayas: Brief Review and Update**
PPJ, Vol. 24 (2002), pp. 90-97
John Carl P. Villanueva, Zarujo C. Girasol, Gerardo C. Maxino
Physics Department, Silliman University
6200 Dumaguete City

24.12 **23rd National Physics Convention and Seminar-Workshop**
14th PPS National Physics Olympics
9th National Physics Fair
April 4-7, 2001
Divine Word College of Tagbilaran
Tagbilaran City 6300
454 Participants
From Luzon, Visayas, and Mindanao

24.13 **Seminar Workshop on Physics in Agriculture**
January 18, 2002
Negros State College of Agriculture
Kabankalan City, Negros Occidental 6111
96 Participants

24.14 **5th PPS-Bukidnon Chapter Seminar-Workshop on Physics Teaching-A Commitment**
January 25-26, 2002
Central Mindanao University
Musuan, Bukidnon
38 Participants

Philippine Physics Journal, Vol. 23 (2001)

23.01 **Physics Para Sa Mahirap: A Shared Reflection**
PPJ, Vol. 23 (2001), pp. 1-4
Francisco Glover, SJ[a], Gerardo C. Maxino[b], Pelagia D. Joven[c], Vicenta C. Maxino[b]
[a] Ateneo de Davao University, Davao City
[b] Silliman University, Dumaguete City
[c] Urios College, Butuan City

23.02 **A Laboratory Power Supply**
PPJ, Vol. 23 (2001), pp. 5-6
Francisco Glover, SJ
Ateneo de Davao University
Davao City

23.03 **Beowulf-Class Computer System at MSU-IIT**
PPJ, Vol. 23 (2001), pp. 7-12
Allen S. Dahili
Computational Physics Laboratory
MSU-Iligan Institute of Technology
Iligan City 9200, Philippines
allen@physics.msuiit.edu.ph
Abstract
A Beowulf class computer system is a type of parallel or distributed system which consists of interconnected commodity-of-the shelf (COTS) personal computers working together as a single integrated computing resource [2,3]. A certain computational task could be divided among the

computers that can result to faster execution of the task [2,11]. At MSU-IIT Beowulf system has been utilized in the study of molecular structures, using GAMESS [5] GROMACS [6], and parallel computing education. An ongoing research is done to use CERNLIB, ROOT [12], JSF [7] and LCLIB [8] in the cluster environment. These softwares are used for the high energy physics simulations for the Joint Linear Collider (JLC).

23.04 **Introduction to High Energy Physics Computer Simulations Using JSF**

PPJ, Vol. 23 (2001), pp. 13-23

Allister Levi C. Sanchez[1], Angeline M. Bacala[1], Akiya Miyamoto[2], Kiesuke Fujii[2]

[1] IITHEP, Department of Physics, MSU-Iligan Institute of Technology
Iligan City 9200

[2] High Energy Accelerator Research Organization (KEK)
Tsukuba, Japan

Abstract

Computers have been indispensable to the field of High Energy Physics. Computer simulations of experiment, done before experiments are actually performed, have been largely successful in guiding the course of those experiments, in many cases predicting the possible outcomes.

In this paper, we provide an introduction to such a simulation tool: JLC Study Framework (JSF). We discuss the processes of event generation, and data analysis. These processes are illustrated using the features provided by JSF.

At the end, we present an example of a simulation study on the detection and measurement of the Higgs boson in the Japan Linear Collider (JLC) presently conducted at the MSU-IIT High Energy Physics Laboratory (IITHEP).

23.05 **Time Spectra of Muon Decay**

PPJ, Vol. 23 (2001), pp. 24-31

R. L. Reserva, R. S. Solidum and A. M. Bacala
Department of Physics
MSU-IIT, Iligan City

Abstract

Recent measurements on the time spectra of atmospheric muon decay have been carried out at Iligan Institute of Technology High Energy Physics (IITHEP) Laboratory, Iligan City. A vertical stack of three plastic

detectors is utilized to identify cosmic ray muons decaying in a wooden absorber. The method employed is a measurement of the distribution in the duration of the time interval between the stopped muon in the plastic scintillator detector and the detection of the emitted electron [1] in the downward direction.

The standard nuclear physics instrumentation, Nuclear Instruments Modules (NIM) and Computer Automated Measurement and Control (CAMAC), are used in this study. A brief description of the properties and the electro weak decay of moun $\mu \rightarrow eV_eV_\mu$ are discussed. The experimental methods and techniques are given.

In this paper, a muon decay time distribution curve is shown where a fit of the distribution to the exponential ($-t/\tau_\mu$) yields a mean lifetime of muon decay $\tau_{\mu,}$=2.176 ± 0.0429 μs, is a value, which is remarkable in good agreement with the internationally accepted value of 2.197 ± 0.0004 μs published in the *1998 Physical Review D.*

23.06 **Radioactivity of Some Root Crops from Negros and Squijor, Philippines (1997-2000)**

PPJ, Vol. 23 (2001), pp. 32-38

Gerardo C. Maxino, Ph.D.
Environmental Radioactivity Research Laboratory
Physics Department, Silliman University
6200 Dumaguete City

Abstract

The radioactivity of 27 root crop samples from different localities of Negros and Squijor Islands, Philippines were measured during the period 1997-2000. Five of these samples exhibited radioactivity definitely above the detection limit.

23.07 **Making Science Visible: Center of Mass Demos**

PPJ, Vol. 23 (2001), pp. 39-42

Ed van den Berg, Ph.D
Science and Mathematics Education Institute
University of San Carlos, Talamban Campus
Cebu City, Philippines
edberg@cnms.net

23.08 **The Dependence of the Index of Refraction of Distilled Water**

on Temperature and Wavelength
PPJ, Vol. 23 (2001), pp. 43-50
Dr. Vicenta C. Maxino and Philip R. Torres
Acoustics and Materials Research Laboratory
Silliman University, Dumaguete City

23.09 **Compositional Analysis of TiN Thin Film on Si Substrate Using Back Scattered Electron Imaging**
PPJ, Vol. 23 (2001), pp. 51-54
Christopher T. Que, R.C. Torralba, G.N.C. Santos, and R.V. Quiroga
Solid State Physics Laboratory, De La Salle University
Metro Manila
cosctq@mail.dlsu.edu.ph, cosrct mail.dlsu.edu.ph,
cosgncs mail.dlsu.edu.ph, cosrvq mail.dlsu.edu.ph
Abstract

Compositional analysis if TiN films on Si substrate was performed using Back Scattered Electron Imaging. From the degree of brightness of the surface of the sample, TiN and the Si substrate can be easily distinguished. The results were verified using EDX analysis.

23.10 **Effect of a Microanomaly on Ambient Gamma Radiation Measurement**
PPJ, Vol. 23 (2001), pp. 55-60
Gerardo C. Maxino, Ph.D. and Giselle Ann J. Alcoran
Environmental Radioactivity Research Laboratory
Physics Department, Silliman University
Dumaguete City

23.11 **Construction of the Taylor Tube: Preliminary Tests and Measurements**
PPJ, Vol. 23 (2001), pp. 61-58
Hope Maxino Bandal Ph D
Acoustics and Materials Research Laboratory
Physics Department, Silliman University
Dumaguete City

23.12 **22nd National Physics Convention and Seminar-Workshop**

13th PPS National Physics Olympics
8th National Physics Fair
April 4-7, 2000
Urios College
Butuan City 8600
327 Participants
From Luzon, Visayas and Mindanao

23.13 **National Seminar-Workshop on Instructional Imaging**
July 8, 2000
Silliman University
Dumaguete City 6200
10 Participants

23.14 **Regional Seminar on Upgrading Physics Teaching**
February 15-16, 2001
College of Education
Samar State Polytechnic College
Catbalogan, Samar
128 Participants

23.15 **Regional Seminar on the Thin Film Technologies in the Philippines and High Temperature Superconductivity**
February 23, 2001
Silliman University
Dumaguete City 6200
67 Participants

Philippine Physics Journal, Vol. 22 (2000)

22.01 **Physics Associations: A Channel for Promoting Science Technology Literacy**
PPJ, Vol. 22 (2000), pp. 1-8
Hope M. Bandal, Ph. D

Physics Department, Silliman University
Dumaguete City

Abstract

One of the strategies that can be used for promoting science and technology literacy is the building of a strong physics community that practices self-reliance and sharing. This scheme is called for the existing situation of inadequate and meager resources in terms of physics teachers and basic laboratory facilities. This dearth hampers the thrust towards relevant and quality physics education.

To build a strong physics community, physics teachers have to organize themselves into a group, assess their resources and capabilities, identify their needs and the activities they can undertake, then develop a strategy and an organizational culture that can sustain the group's activities. The Philippine Physics Society (PPS), using such an approach, is presented as a case study. This paper presents its philosophy, programs, activities, and impact.

22.02 **The BS Physics Program at Silliman University: A Curricular Innovation**

PPJ, Vol. 22 (2000), pp. 9-17
Dr. Vicenta C. Maxino
Silliman University, Dumagute City

Abstract

Considering the small enrollment of the BS Physics program throughout the country, the paper presents the result a curricular innovation done at Silliman University, Dumaguete City. BS Physics With Emphasis in Computer Applications was offered at Silliman University in 1992 followed by BS Physics With Emphasis in Medical Applications a year later. This innovative curriculum is discussed, analyzed and compared with a traditional BS Physics curriculum. The yearly enrollment of the program, the employment distribution of its graduates and the problems that it faces are given.

22.03 **From Folk Toys to Physics of Liquids**

PPJ, Vol. 22 (2000), pp. 18-24
Gerardo C. Maxino
Physics Department, Silliman University
Dumaguete City

Abstract

This paper presents the use of folk toys as an approach to make the learning of physics of liquids more interesting and understandable in a climate of paucity of learning resources and of cultural deprivation. The methodology employed involves a survey of folk toys in the community, their classification according to the main areas of physics, the identification of the physics principles and concepts implicit in their construction and use, and the design of demonstrations and quantitative experiments. Folk toys can improve the teaching of physics of liquids, covering such topics as Archimedes' principle of buoyancy, liquid pressure, surface tension, capillarity, flow through an orifice, flow through a constriction, liquid resistance, viscosity, and others.

22.04 **A Cheaper Alternative for a Lock-In Amplifier to Frequency Stabilize a Laser to an Optical Transition**
PPJ, Vol. 22 (2000), pp. 25-30
Marian F. Baclayon, John W. Liwag and Gerrit J. Kuik
Department of Physics
University of San Carlos
Talamban Campus, Cebu City

22.05 **Boyle's Law: A Simple Experiment**
PPJ, Vol. 22 (2000), pp. 31-37
Tomoaki Fukuda and Jo-ann M. Cordovilla
Regional Science Teaching Center
Bicol University, Legaspi City

22.06 **Some Toys Used For Teaching/ Learning Rotational Motion: A Brief Review**
PPJ, Vol. 22 (2000), pp. 38-44
Ma. Lina R. Eparwa
St. Joseph Seminary College
Sibulan, Negros Oriental

22.07 **Optical Methods of Aerosol Measurement: The Optical Particle Counter**
PPJ, Vol. 22 (2000), pp. 45-53
Clare C. Maxino

Ateneo de Manila University
Loyola Heights, Quezon City

22.08 **Coefficient of Linear Expansion of Selected Philippine Hardwood**
PPJ, Vol. 22 (2000), pp. 54-58
Hope M. Bandal Ph D and Juvelyn S. Reniva
Silliman University, Dumaguete City

22.09 **X-ray Intensity Reduction Using Niobi-X**
PPJ, Vol. 22 (2000), pp. 59-64
Gerado C. Maxino Ph D a and Asonita J. Parmisana b
[a] Evironmental Radioactivity Research Laboratory
Physics Department, Silliman University
Dumaguete City
[b] College of Arts and Sciences
Cebu Doctors College
Cebu City

22.10 **Notes on Measurements with a Stroboscope**
PPJ, Vol. 22 (2000), pp. 55-57
Manuel A. Almerez
College of Arts and Sciences
University of Southeastern Philippines
Davao City

22.11 **21st National Physics Convention and Seminar-Workshop**
12th PPS National Physics Olympics
7th National Physics Fair
April 7-10
Liceo de Cagayan University
Cagayan de Oro City 9000
287 Participants

22.12 **Math-Science Seminar-Workshop**
October 15, 1999
Divine Word College of Bangued

Bangued, Abra
29 Participants

22.13 **First Joint Division Physics Seminar-Workshop in Caraga Region**
Area I (Agusan del Norte, Ahusan del Sur and Butuan City)
November 11, 1999
Urios College
Butuan City
52 Participants

22.14 **First Joint Division Physics Seminar-Workshop in Caraga Region**
Area II (Surigao del Sur, Siargao, Surigao del Norte, Surigao City)
November 12, 1999
Surigao City Pilot School
Surigao City
45 Participants

22.15 **Seminar on Electromagnetism and Optics: Interactive Teaching**
February 5, 2000
University of San Carlos-Talamban
Cebu City
109 Participants

22.16 **Seminar-Workshop on Creative Thinking**
11th General Assembly
Philippine Physics Society-Cebu Chapter
Cebu Doctor's College
Cebu City
50 Participants

22.17 **Updates in Physics and Chemistry**
August 26, 1999
Silliman University
Dumaguete City
77 Participants

22.18 **Inter-Regional Seminar-Workshop on Optical Refraction and Instructional Imaging**
July 23-24, 1999
Physics Department
Silliman University
Dumaguete City
8 Participants

Philippine Physics Journal, Vol.21 (1999)

21.01 **What is Science?**
PPJ, Vol. 21 (1999), pp. 1-5
Dr. Martin Phipps
Physics Department, University of San Carlos
Talamban Campus, Cebu City

21.02 **Home-Made Logic Gate Demonstrator**
PPJ, Vol. 21 (1999), pp. 6-7
Francisco Glover, Ph D, S.J. and Takayuki Nitta
Regional Science Teaching Center
Ateneo de Davao University
Davao City

21.03 **An Overview of Signal Processing Techniques**
PPJ, Vol. 21 (1999), pp. 8-11
Zarujo C. Girasol
Physics Department, Silliman University
Dumaguete City

21.04 **Sound Analysis of the Noise from a Punch Press**
PPJ, Vol. 21 (1999), pp. 12-20
Cherile Obate-Yap
Department of Physics
University of San Carlos, Cebu City

21.05 **Physics Literature in Central Visayas, Philippines, 1955-1995**
PPJ, Vol. 21 (1999), pp. 21-40
Gerardo C. Maxino, Ph D
Silliman University, Dumaguete City

21.06 **Application of Artificial Neural Network in Stereoscopic Computer Vision: A Preliminary Study**
PPJ, Vol. 21 (1999), pp. 41-56
Clare C. Maxino and Rommel G. Bacabac, SVD
University of San Carlos
Cebu City

21.07 20th National Physics Convention and Seminar-Workshop
11th National Physics Olympics
6th National Physics Fair
April 1-4, 1998
University of San Carlos
Cebu City
269 Participants

Philippine Physics Journal, Vol. 20 (1998)

20.01 **Why Should We Care About Particle Physics?**
PPJ, Vol. 20 (1998), pp. 1-4
Dr. Martin Phipps
Physics Department
University of San Carlos
Talamban Campus
6000 Cebu City

20.02 **Materials For Teaching About Energy**
PPJ, Vol. 20 (1998), pp. 5-10
Ed van den Berg a and Wim Grosheide b

[a] University of San Carlos
Talamban Campus
6000 Cebu City
[b] Hermann Wesselink College
Amstelveen, Netherlands

20.03 **Modernizing Physics Education: Implementation And Implications**

PPJ, Vol. 20 (1998), pp. 11-13
Gerardo C. Maxino
Physics Department
Silliman University
6200 Dumaguete City

20.04 **An Introduction To Lasers And Some Applications**

PPJ, Vol. 20 (1998), pp. 14-21
Gerrit J. Kuik, Ph.D.
Physics Development Project
University of San Carlos
Talamban Campus
6000 Cebu City

20.05 **Two Proposed Experiments For The University Of San Carlos Optics Laboratory**

PPJ, Vol. 20 (1998), pp. 22-31
Helena S. de los Reyes, MS Physics
University of San Carlos
Talamban Campus
6000 Cebu City

20.06 **Reduction Of Radiation Intensity Using An Extra Filter: A Laboratory Module**

PPJ, Vol. 20 (1998), pp. 32-36
Asonita Jabla Parmisana
Cebu Doctors College
6000 Cebu City

20.07 **Free Fall And "Not-Free" Fall**
PPJ, Vol. 20 (1998), pp. 37-38
Ed van den Berg
Science and Mathematics Education Institute
University of San Carlos
Talamban Campus
6000 Cebu City

20.08 **Radioactivity Of Some Banana Varieties From Negros Oriental, 1997-1998**
PPJ, Vol. 20 (1998), pp. 39-46
Vicenta Cabahug Maxino
Physics Department, Silliman University
6200 Dumaguete City

20.09 **The Versatile Taylor Tube**
PPJ, Vol. 20 (1998), pp. 47-50
Hope Maxino Bandal
Physics Department
Silliman University
6200 Dumaguete City

20.10 **19th National Physics Convention and Seminar-Workshop**
10th National Physics Olympics
5th National Physics Fair
April 1-4, 1997
Silliman University
Dumaguete City
236 **Participants**

Philippine Physics Journal, Vol. 18-19 (1996-1997)

18-19.01 **Nichood Through Quality Physics Education**
PPJ, Vol. 18-19 (1996-1997), pp. 1

Angel C. Alcala, Ph.D.
Chairman, Commission on Higher Education
Metro Manila

18-19.02 **Why Physics?**
PPJ, Vol. 18-19 (1996-1997), pp. 2-4
Francisco Glover, S.J.
Ateneo de Davao University
Davao City

18-19.03 **A Survey Of Street Noise In Downtown Dumaguete City**
PPJ, Vol. 18-19 (1996-1997), pp. 5-12
Hope Maxino Bandal, Ph.D.
Silliman University
Dumaguete City

18-19.04 **Concept Mapping, Gowin's Vee And The Learning Theories Around**
PPJ, Vol. 18-19 (1996-1997), pp. 13-22
Nenita A. Malaluan, Ph.D.
Ateneo de Davao University
Jacinto St., Davao City

18-19.05 **Laser-Induced Fluorescence Spectra Of Some Green Plants Commonly Found In The Philippines**
PPJ, Vol. 18-19 (1996-1997), pp. 23-28
Raymund S. Vizcarra and Minella C. Alarcon
Department of Physics
Ateneo de Manila University
Quezon City, Philippines

Abstract

Laboratory and aerial remote experiments using the laser-induced fluorescence (LIF) properties of plants have been conducted to detect vegetation, plant stress, and to identify plant groups or plant species. An investigation was made on the feasibility of using laser-induced fluorescence as a technique to identify Philippine green plants. A 337.1 nm output nitrogen laser was used to induce fluorescence. The measured LIF spectra of freshly cut leaves of bamboo, coconut, palm,

papaya, and starapple are presented. Experimental results and analysis of the LIF spectra are discussed.

18-19.06 **High Power Molecular Gas Laser: The Carbon Dioxide Laser**
PPJ, Vol. 18-19 (1996-1997), pp. 29-38
Raul R. Olaguer
Division of Physical Sciences and Mathematics
University of the Philippines - Visayas
Miagao, Iloilo

18-19.07 **Water Studies In Cebu: A Review**
PPJ, Vol. 18-19 (1996-1997), pp. 39-45
Florencio Labiste
St. Mary Academy
Oslob, Cebu

18-19.08 **Physical Properties Of Some Cooking Oils**
PPJ, Vol. 18-19 (1996-1997), pp. 46-54
Vicenta C. Maxino and Dinah Rose M. Baseleres
Silliman University

18-19.09 18th National Physics Convention and Seminar-Workshop
9th National Physics Olympics
4th National Physics Fair
April 9-12, 1996
Ateneo de Davao University
Davao City
271 Participants

Philippine Physics Journal, Vol. 16-17 (1994-1995)

16-17.01 **The Philippine Physics Journal: First Fifteen Years With Annotated Bibliography, 1979-1993**

PPJ, Vol. 16-17 (1994-1995), pp. 1-17
Gerardo C. Maxino, Ph D
Dean, College of Arts and Sciences
Silliman University
6200 Dumaguete City

16-17.02 **Notes On Physics In The Year 2000**
PPJ, Vol. 16-17 (1994-1995), pp. 18-23
Michael McInerney, Ph D
Rose-Hulman Institute of Technology
Terra Haute, Indiana, USA
(Fulbright Visiting Professor at the University of San Carlos, Cebu City)

16-17.03 **Young's Modulus Of Certain Kinds Of Leather**
PPJ, Vol. 16-17 (1994-1995), pp. 24-32
Dr. Hope M. Bandal and Maria Corina E. Camazo
Silliman University

16-17.04 **Notes On The Status Of Nuclear Science In The Philippines**
PPJ, Vol. 16-17 (1994-1995), pp. 33-36
Aida Davila Eugenio
Deputy Director
Philippine Nuclear Research Institute
Diliman, Quezon City

16-17.05 **Making The Physics Program Relevant In The Aviation Maintenance Technology Curriculum: A Rationale**
PPJ, Vol. 16-17 (1994-1995), pp. 37-40
Nathaniel M. Heralde
Philippine State College of Aeronautics
Mactan Air Base, Lapulapu City

16-17.06 **Physics Education For Scientific And Technological Literacy**
PPJ, Vol. 16-17 (1994-1995), pp. 41-48
Dr. Bruce Marsh

State University of New York-Albany
Albany, New York, United States of America

Abstract

As physics educators we wish to impart scientific literacy to members of the general public so that they may (1) benefit personally from an understanding of the way nature and technology work in phenomena and devices encountered in everyday life, (2) become more productive members of our increasingly technological society, and (3) share our intellectual enjoyment in partial comprehension of the universe. The minimum requirements for scientific literacy are a firm belief in experimental evidence for relating cause and effect, a good understanding of basic concepts in science, and the ability to read and interpret differet representations of quantitative information, including relations among quantities. The different representations include words, diagrams, tables of numbers, and graphs. Scientific literacy does not require an ability to manipulate symbolic equations, but it does require facility in the use of ratios and proportions.

16-17.07 **Photovoltaic Pumping Systems (Design Calculations And Layout)**

PPJ, Vol. 16-17 (1994-1995), pp. 49-59

Bernd Fahlenbock
GTZ Adviser
Philippine-German Photovoltaic Pumping Project
University of San Carlos

16-17.08 **Radioactivity Of Some Grass And Vegetable Samples From Negros Oriental, 1983-1996**

PPJ, Vol. 16-17 (1994-1995), pp. 60-69

Vicenta C. Maxino
Physics Department, Silliman University

16-17.09 **16th National Physics Convention and Seminar-Workshop**
7th National Physics Olympics
2nd National Physics Fair

April 5-8, 1994
University of Eastern Philippines
University Town, Catarman
Northern Samar

107 Participants

16-17.10 17th National Physics Convention and Seminar-Workshop
8th National Physics Olympics
3rd National Physics Fair
April 4-7, 1995
Central Philippine University
Iloilo City
192 Participants

Philippine Physics Journal, Vol. 15 (1993)

15.01 **Physics Literacy For People Empowerment**
PPJ, Vol. 15 (1993), pp. 1-6
Herman van Engelen, SVD, Ph.D.
University of San Carlos
Cebu City

15.02 **Electrical Conduction: Inexpensive Experiments**
PPJ, Vol. 15 (1993), pp. 7-13
Dr. Gerardo C. Maxino
Professor and Chairman, Physics Department
Silliman University
Dumaguete City

15.03 **Introductory Physics Education For Non-Science Majors: The Silliman Experience**
PPJ, Vol. 15 (1993), pp. 14-21
Dr. Vicenta Cabahug Maxino
Physics Department, Silliman University

Dumaguete City

15.04 **A Compact Fluorescent (PL) Lighting Unit For Solar Home Systems**

PPJ, Vol. 15 (1993), pp. 22-28

Alvin N. Urgel[a] and Romulo G. Almia[b]
[a] Physcis Research
University of San Carlos
Cebu City
[b] Palompon Institute of Technology
Palompon, Leyte

Abstract

The PL9-E is the fifth revision of the compact fluorescent (PL) lamp series developed by the Physic Research. Although intended for use in photovoltaic (PV) home lighting systems, it can be utilized in other 12 Vdc systems. Considerations for the design include technical and user requirements, as well as the local availability of components. PL fluorescent lamps are recommended for enhanced illumination and longer life compared to ordinary fluorescent tubes.

15.05 **An Experimental Determination Of Solar Power Using A Self- Designed Apparatus**

PPJ, Vol. 15 (1993), pp. 29-37

Francisco E. Ablong, Jr., MAST (Physics)
Silliman University
Dumaguete City

15.06 **The Scientist As A Humanist**

PPJ, Vol. 15 (1993), pp. 38-43

Hope M. Bandal, Ph.D.

Physics Department
Silliman University
Dumaguete City

15.07 **Addressing Students' Misconceptions Of Free Fall: An Exploratory Study**
PPJ, Vol. 15 (1993), pp. 44-53
APPTEA Philippines Research Group

15.08 **Energy Conservation And Projectile Motion On A Curtain Rail Track**
PPJ, Vol. 15 (1993), pp. 54-59
Dr. Vicenta C. Maxino
Physics Department, Silliman University
Dumaguete City

15.09 **Physics Education In Central Visayas, 1953-1993**
PPJ, Vol. 15 (1993), pp. 60-70
Gerardo C. Maxino, MS Physics, Ph D
Silliman University
Dumaguete City

15.10 **15*th* National Physics Convention And Seminar-Workshop**
6th National Physics Olympics
1st National Physics Fair
April 1-4, 1993
University of Negros Occidental - Recoletos
Bacolod City
307 Participants

Philippine Physics Journal, Vol. 12-14 (1990-1992)

12-14.01 **The Philippine Physics Society (PPS) Information And Traditions**
PPJ, Vol. 12-14 (1990-1992), pp. 1-9
Dr. Vicenta C. Maxino
PPS National Secretary

12-14.02 **Educational Uses Of Information Technology In Research And Development In Physics**
PPJ, Vol. 12-14 (1990-1992), pp. 10-17
Dr. Catalina Y. Diluvio
University of San Carlos
Cebu City

12-14.03 **Learning To Understanding**
PPJ, Vol. 12-14 (1990-1992), pp. 18-22
Juergen Schoenherr
Team Leader, GTZ-Science Teaching Improvement Project

12-14.04 **Measuring The Sun**
PPJ, Vol. 12-14 (1990-1992), pp. 23-29
Alvin N. Urgel
Water Resources Center
University of San Carlos
Cebu City
Abstract

The sun never fails to rise every morning. Moving across the sky from East to West. Radiant energy from the sun causes wind, waves and heat, truly a fundamental energy source. Solar energy is harnessed by plants to sustain life on planet earth.

But what is the sun made of? A great ball of fire? Will it ever stop burning? What portion of the sun's energy are we receiving? How is the sun's energy measured? What instruments are used? Does anybody ever keep track of the solar radiation? Of what importance is solar data to farmers and non-farmers?

These questions and more are addressed in this paper to give more insight about the suns's irradiance and the factors which affect it. Finally, actual measurements by a Class A sensor coupled to a digital

data logger affords data of reasonable accuracy.

12-14.05 **Why Are Students Not Taking The BS Physics Degree?**
PPJ, Vol. 12-14 (1990-1992), pp. 30-35
Dr. Vicenta C. Maxino
Silliman University

12-14.06 **Folk Toys And Implements: Physics Literacy For The Masses**
PPJ, Vol. 12-14 (1990-1992), pp. 36-44
Gerardo C. Maxino, Ph D
Chairman, Physics Department, Silliman University
Dumaguete City, Philippines
Abstract

UNESCO's program on Education for All emphasizes the human right of access to knowledge and skills needed to exercise greater control of one's life and environment. In developing countries,functional science literacy eludes many rural dwellers.

The use of folk toys and implements in ill-equipped rural schools and adult literacy classes can improve physics education. Folk toys and implements show many physics concepts latent in a community's experience. Demonstrations and quantitative experiments have been developed. Aside from removing the dichotomy between classroom and real life, the use of folk toys and implements stimulates the development of appropriate technology.

12-14.07 **EDCOM Recommendations And Implications To Physics Teaching**
PPJ, Vol. 12-14 (1990-1992), pp. 45-50
Dr. Vivien M. Talisayon
Deputy Director, Philippine Science High School
Professor, College of Education, University of the Philippines

12-14.08 **Sound Absorption By Styrofoam Cones**
PPJ, Vol. 12-14 (1990-1992), pp. 51-60
Hope M. Bandal, Ph.D.
Physics Department
Silliman University
Dumaguete City

12-14.09 **The Physics Of The Egg Drop**
PPJ, Vol. 12-14 (1990-1992), pp. 61-65
Dr. Gerardo C. Maxino
Chairman, Physics Department, Silliman University
Dumaguete City

12-14.10 **12th Philippine Physics Society National Convention and 3rd National Physics Olympics For Teachers**
April 5-8, 1990
Visayas State College Of Agriculture
Baybay, Leyte
122 Participants

12-14.11 **13th Philippine Physics Society National Convention and 4th National Physics Olympics For Teachers**
June 3-5, 1991
University of San Carlos
Cebu City
179 Participants

12-14.12 **14th Philippine Physics Society National Convention and 5th National Physics Olympics For Teachers**
April 1-4, 1992
Divine World College of Tagbiliran
Tagbiliran City
140 Participants

Philippine Physics Journal, Vol. 9-11 (1987-1989)

9-11.01 **Radioactive Pollution**
PPJ, Vol. 9-11 (1987-1989), pp. 1-8
Manuel R. Eugenio, Ph.D.

Director, Science Educational Institute
Department of Science and Technology

9-11.02 **Superconductor Primer And Update**
PPJ, Vol. 9-11 (1987-1989), pp. 9-21
Reuben Ballesil
Mindanao State University
Marawi City

9-11.03 **Radiation Mapping In Central Philippines**
PPJ, Vol. 9-11 (1987-1989), pp. 22-26
Vicenta C. Maxino
Silliman University
Dumaguete City

9-11.04 **Improvised Optical Lever Apparatus For Measuring Linear Expansion**
PPJ, Vol. 9-11 (1987-1989), pp. 27-35
Jimmy R. Rosillo

9-11.05 **The Philippine Wood Industry: Its Implicatins To The Environment And Community Development**
PPJ, Vol. 9-11 (1987-1989), pp. 36-40
James O. Lacandula

9-11.06 **Biogas: A Non-Conventional Source Of Energy**
PPJ, Vol. 9-11 (1987-1989), pp. 41-49
Roque C. De Pedro Jr.

9-11.07 **The Ladder ARC: An Improvised Apparatus**
PPJ, Vol. 9-11 (1987-1989), pp. 50-53
Reuben Ballesil
Mindanao State University
Marawi City

9-11.08 **Potential Photovoltaic Applications**
PPJ, Vol. 9-11 (1987-1989), pp. 54-58
Alvin N. Urgel
University of San Carlos

9-11.09 **Physics In The Classroom And Community: A Physicist's Viewpoint**
PPJ, Vol. 9-11 (1987-1989), pp. 59-62
Herman van Engelen, SVD, Ph.D.
University of San Carlos
Cebu City

9-11.10 **Physics In The Classroom And Community: An Educator's View Point**
PPJ, Vol. 9-11 (1987-1989), pp. 63-66
Dr. Serviliano C. de la Crus, Jr.
Director, DECS Region VIII
Tacloban City

9-11.11 **The Case For Scientific Literacy**
PPJ, Vol. 9-11 (1987-1989), pp. 67-74
Gerardo C. Maxino
Dumaguete City

9-11.12 **Cebu And Its Energy Needs**
PPJ, Vol. 9-11 (1987-1989), pp. 75-77
Herman van Engelen, SVD, Ph.D.
USC Water Resources Center
University of San Carlos
Cebu City

9-11.13 **9th Philippine Physics Society**
National Convention
April 7-10, 1987
Urios College

Butuan City
146 Participants

9-11.14 **10th Philippine Physics Society**
National Convention and
1st National Physics Olympics For Teachers
April 6-9, 1988
Divine Word University of Tacloban
Tacloban City
196 Participants

9-11.15 **11th Philippine Physics Society**
National Convention and
2nd National Physics Olympics For Teachers
April 7-10, 1989
College of Arts and Sciences
Central Mindanao University
Musuan, Bukidnon
125 Participants

Philippine Physics Journal, Vol. 6-8 (1984-1986)

6-8.01 **Physics And The Environment**
PPJ, Vol. 6-8 (1984-1986), pp. 1-4
Dr. Venancio L. Alcantara

6-8.02 **Communicating Physics**
PPJ, Vol. 6-8 (1984-1986), pp. 5-7
Dr. Theta C. Ponce
National Institute of Physics
University of the Philippines
Dilliman, Quezon City

6-8.03 **Physics And Social Responsibility**
PPJ, Vol. 6-8 (1984-1986), pp. 8-11
Dr. Manuel Eugenio

6-8.04 **A Study Of The Gamma Spectrum Of Some Soil Samples From Mabinay And Ayungon, Negros Oriental**
PPJ, Vol. 6-8 (1984-1986), pp. 12-32
Vicenta C. Maxino

6-8.05 **Environmental Radioactivity Measurements In The Visayas, Philippines**
PPJ, Vol. 6-8 (1984-1986), pp. 33-39
Vicenta C. Maxino and Gerardo C. Maxino
Silliman University
Dumaguete City

6-8.06 **Rain Simulator: A Physical Model Of Rainfall-Runoff**
PPJ, Vol 6-8 (1984-1986), pp. 40-50
Ed Walag
USC Water Resources Center

6-8.07 **The USC Water Resources Center: Development And Prospects**
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Fr. Herman van Engelen, SVD
USC-WRC Director

6-8.08 **Wind Energy**
PPJ, Vol. 6-8 (1984-1986), pp. 55-61
Engr. Danilo Gravador
PNOC ERDC

6-8.09 **The Windmill**
PPJ, Vol. 6-8 (1984-1986), pp. 62-65
Dr. Venancio L. Alcantara

6-8.10 **An Experimental Determination Of The Solar Constant In Dumaguete City**
PPJ, Vol. 6-8 (1984-1986), pp. 66-71
Delilah J. Ablong
Central Visayas Polytechnic College

6-8.11 **The Regulations And Licensing Of Radioactive Materials And Facilities In The Philippines - An Overview**
PPJ, Vol. 6-8 (1984-1986), pp. 72-83
Vangeline E. Kinilitan

6-8.12 **The Determination Of The Center Of Gravity Of A Thin Triangular Plate: A Mathematical Approach**
PPJ, Vol. 6-8 (1984-1986), pp. 84-89
Caesar V. Cavales
Department of Mathematics
Silliman University
Dumaguete City

6-8.13 **6th (Southern) Philippine Physics Society National Convention**
April 5-6, 1984
University of Negros Occidental - Recoletos
Bacolod City
96 Participants

6-8.14 **th (Southern) Philippine Physics Society National Convention**
April 12-14, 1985
St. Paul College
Dumaguete City
80 Participants

6-8.14 **8th (Southern) Philippine Physics Society National Convention**
April 7-10, 1986
Central Philippine University
Iloilo City

122 Participants

Philippine Physics Journal
((S)PPS Proceedings), Vol. 4-5 (1982-1983)

4-5.06 **Divisibility Test**

PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 41-44

Feliciano I. Labrador
Mathematics Department Silliman University

4-5.07 **Physics And Energy Development**

PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 45-50

Dr. Venancio Alcantara
Head, Wind, Water and Wave
Energy Research Division
PNOC-ERDD

4-5.08 **Some Thoughts For Physicists**

PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 51-52

Dr. Quintin S. Doromal
President, Silliman University

4-5.09 **Comparison Of π And ρ Rescattering In p(p, p)n π^+**

PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 53-62

Jose C. Martinez
Physics Department
University of the Philippines
Diliman, Q. C. Philippines 3004

Abstract

The role of π ρ rescattering in p(p,p)nπ + is studied within the isobar model. It is shown that rescattering alone does not consistently fit data. Inclusion of ρ rescattering improves results. The ρ is found to appreciably cancel the π contribution to the T-matrix.

4-5.10 **General Relativity: An Overview**

PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 63-79

Roger Posadas, Ph.D.
President, Samahang Pisika ng Pilipinas
Chairman, Physics Department
University of the Philippines

4-5.11 **Teaching Physics For The Industry**
PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 80-86
Alberto M. Campos
Professor, College of Engineering
De La Salle University

4-5.12 **Similitude In Teaching And Research**
PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 87-89
Vivien M. Talisayon
UP Science Education Center
Diliman, Quezon City

4-5.13 **Philippine Atomic Energy Commission And Its Training Program**
PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 90-92
Totillano A. Ragot
Executive Assistant
Philippine Atomic Energy Commission
Diliman, Quezon City

4-5.14 **Fourth Southern Philippines Meeting On Physics Research And Teaching**
April 1-4, 1982
Silliman University and Foundation University
Dumaguete City
74 Participants

4-5.15 **5th (Southern) Philippines Physics Society National Convention**
April 7-10, 1983
Xavier University
Cagayan de Oro City
87 Participants

Philippine Physics Journal
((S)PPS Proceedings), Vol. 2-3 (1980-1981)

2-3.08 **Laplace's Equation**
PPJ ((S)PPS Proceedings), Vol. 2-3 (1980-1981), pp. 26-38
Fr. Herman van Engelen, SVD, Ph.D.

2-3.09 **Second Southern Philippines Meeting On Physics Research And Teaching**
May 26-27, 1980
University of San Carlos
Cebu City
55 Participants

2-3.10 **Third Southern Philippines Meeting On Physics Research And Teaching**
MSU-Iligan Institute of Technology
Iligan City
122 Participants

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Zoilo M. Bartolome, Ph.D.

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Manuel O. Hizon, Ph.D.

1.07 **Maintaining The Physics Program: An Administrator's Point Of View**
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Fr. Mar Alingasa, SVD

1.08 **Physics Curricula And Physics Consortium: The De La Salle Experience**
PPJ (The (S)PPS Proceedings), Vol. 1 (1979), pp. 44-46
Dr. Bayani C. Rivero

1.09 **Does Physics Have A Future In The Philippines?**
PPJ (The (S)PPS Proceedings), Vol. 1 (1979), pp. 47-53
Roger R. Posadas, Ph.D.
President, Samahang Pisika ng Pilipinas

1.10 **The Importance Of Physics In National Development**
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1.11 **The Place Of Mathematics In Physics Education**
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Alberto Campos, Ph.D.

1.12 **Physics And The Community**
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Fr. Herman van Engelen, SVD, Ph.D.

1.13 **Southern Philippines Meeting On Physics Research And Teaching and (Southern) Philippines, Physics Society 1979 Convention**
March 31-April 1, 1979
Dumaguete City
96 Participants