



June 2018
Issue #6

DE LA SALLE UNIVERSITY

RESEARCH • INNOVATION • CREATIVITY

Questions



CHANGING THE MARGINS
TECHNOLOGY HISTORY ECONOMICS
EDUCATION ENGINEERING SCIENCE
BUSINESS HEALTH ENVIRONMENT

WE ASK TO

***KNOW
ACT
CHANGE***



QUESTIONS

This issue of *QUESTIONS* features research initiatives that open new perspectives for nation-building and offer support for the development of society, especially the marginalized and at-risk sectors.

***QUESTIONS** is a publication of De La Salle University featuring research projects and creative endeavors by its faculty.*

***QUESTIONS** supports De La Salle University's vision-mission to be "a leading learner-centered and research university, attuned to a sustainable Earth, bridging faith and scholarship in the service of society, especially the poor and marginalized."*



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HOW CAN WE LEND A HELPING HAND?

The Agapay Project pursues the development of games-motivated robotic exoskeletons to aid in the rehabilitation of stroke survivors in the Philippines.



Survivors of stroke essentially need professional support to recover and manage their daily activities. Regaining the use of upper limbs, for instance, can be arduous and a great challenge for them. It thus requires various strategies and interventions—and for a group of DLSU researchers—as much total and long-term commitment to develop a kind of helping hand to bring patients back on their feet.

Dr. Nilo Bugtai, chair of the University’s Manufacturing Engineering and Management Department (MEM) and head of its Biomedical Devices Innovation and e-Health Research Group, shares an ongoing research project called “Agapay”, which seeks to offer support for those who have suffered from stroke. A Filipino word, *agapay* translated into English means “to reinforce” or “to support” and an apt name for the robotic exoskeletons that his team is currently developing to aid in patients’ rehabilitation.

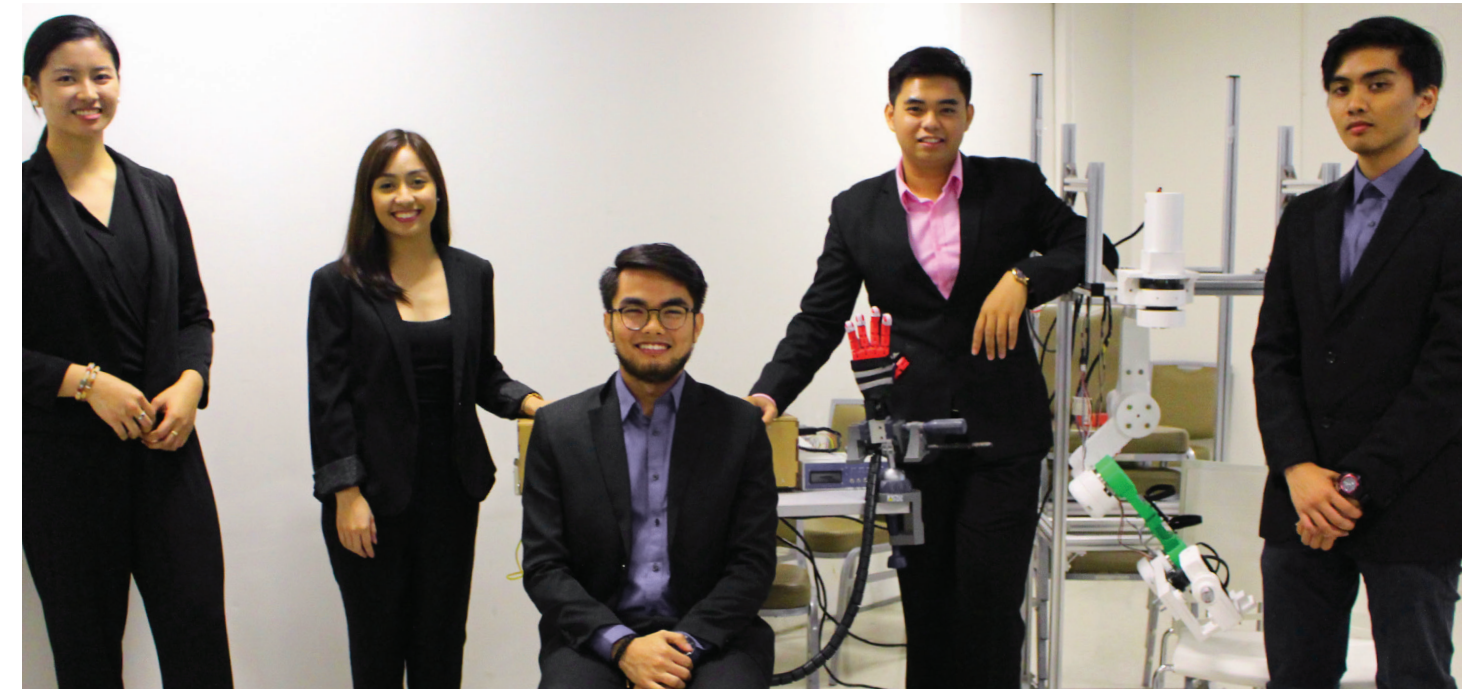
Bugtai serves as the lead of the Agapay Project, a multi-million peso grant-in aid by the Philippine Council for Health Research and Development of the Department of Science and Technology. From DLSU, he taps the expertise and help of fellow faculty as well as student researchers not only from his home department but also from DLSU’s Electronics and Communications Engineering Department and Physics Department.

Likewise, the DLSU team collaborates with the Rehabilitation Medicine Department of the University of the Philippines-Manila-Philippine General Hospital. “It would be detrimental to both the user and the developer to pursue the development of a device without the medical experts’ opinion on its applications,” he says of the multi-disciplinary work that the research entails.

Student researcher BS/MS Manufacturing Engineering graduate Aira Patrice Ong shares that during the initial phase of their study, which involved the development of product design and prototyping, they conducted observation sessions in different rehab centers in the Philippines such as DLSU Medical Center Dasmariñas, Chuang Hua Hospital, Cebu Doctors’ Hospital, and Perpetual Succor Hospital.



BIOMEDICAL ENGINEERING



The first phase of the project was completed in September 2017, with the development of a 12-degree-of-freedom wearable robotic exoskeleton that can perform the movements of the upper limbs, from the shoulder and elbow to the wrist and fingers.

Bugtai says that the focus on the upper limbs aims to directly improve the region that enables a person to carry out daily living activities. It is biomimetic, or one that can mimic a biochemical process. It is designed to be comfortable, user-friendly, and safe to use. It uses an adjustable and lightweight frame and has a biofeedback system that can record

neuromuscular activity. To make rehab sessions engaging with the use of this device, the researchers will introduce games with integrated visual elements and touch sensation, and will allow for active and passive motion exercises.

The DLSU research team also emphasizes an important factor to consider in its design: it must be cost-effective so that it can be accessible to medical rehab clinics and practitioners.

For the second phase of the research, Bugtai says they are currently conducting safety and preclinical

testing, before going into clinical trials, which is the third phase. The last phase involves technology transfer and manufacturing. “Being the country’s pioneering researchers in this field, we have to be the one to set the standard in terms of upper limb rehabilitation,” he points out.

“Through the aid of robotics, we hope to contribute to helping Filipino stroke victims towards faster recovery, and open avenues to a healthier Philippines,” Bugtai says.

Dr. Nilo Bugtai, chair of the DLSU’s Manufacturing Engineering and Management Department and head of its Biomedical Devices Innovation and e-Health Research Group, is the faculty lead of the Agapay project.

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CAN THIS MAKE YOU QUIT SMOKING?

A study by DLSU Economics researchers Dr. Myrna Austria and Jesson Pagaduan assesses the impact of Sin Tax Law on the demand for cigarettes.



The World Health Organization considers excise taxes on tobacco products as the most effective way to reduce the demand for cigarettes. Studies have shown that when taxes cause tobacco prices to rise, there is a consequent decrease in the demand for the product. Following this, Republic Act No.10351 or the Sin Tax Reform Act was passed into law on December 2012. It was primarily a health measure for the Philippines, which is one of the largest tobacco-consuming countries in the Western Pacific. The law was aimed at addressing public health issues related to alcohol and tobacco consumption, and also as a remedy to structural weaknesses in the country's tax system on tobacco.

Nearly six years after the law was implemented, any effect of the tax reform law was ripe for evaluation. Did the resulting increase in prices have an effect on the demand for cigarettes, as expected? Economics researchers Dr. Myrna Austria and Jesson Pagaduan took to the task of finding out. Their working paper for the Angelo King Institute for Economics and Business Studies, "Assessing the Impact of the Sin Tax Reform Law on the Demand for Cigarettes," sought to determine, among other things, the impact of tax reform on cigarette consumption.

Using data from the 2009 and 2015 Family Income and Expenditure Survey (FIES) from the Philippine Statistics Authority, the researchers estimated price elasticities or the change in demand for cigarettes in relation to price changes brought about by tax reform.

It was the first study in the country that used a two-part estimation strategy in examining the demand for cigarettes. It measured the effect of the law on two key parameters: smoking prevalence or the number of smokers, and smoking intensity or the demand for cigarettes.

Previous studies suggested that tax-induced price increases tend to decrease the demand for cigarettes. To test this hypothesis and address gaps in data, the researchers constructed a two-year independently pooled cross section of the 2009 and 2015 FIES, which were collected before and after the Sin Tax Reform Law was enacted. The analyses confirmed that tax-induced price increases on tobacco, after the 2012 Sin Tax Reform Law, had a negative effect on cigarette consumption, as household-level cigarette consumption decreased in the post-tax reform period in 2015.

TAX REFORM



Demand < Smokers

Interestingly, the study showed that the impact of higher prices on smoking intensity is significantly higher than on smoking prevalence. This means that the Sin Tax Reform Law has reduced the number of cigarettes consumed by smokers more than the number of cigarette users over the period 2009 to 2015. Simply put, while individuals smoked fewer cigarettes, the number of smokers did not lessen as much.

The results also supported extant literature about the correlation of higher incomes and college education and the demand for cigarettes. Wealthier, college-educated individuals are more likely to consume less cigarettes and poor households are relatively more responsive to increases in cigarette price than rich households.

Based on these insights, the researchers endorsed the continuation of an annual increase in excise tax, but recommended that inflation rate and increase in per capita income be factored in determining the increase. This will ensure that any increase in price due to excise tax is always higher than the increase in income and not lower than the current inflation rate.

A government-run tobacco treatment or rehabilitation program was also recommended as a means to support smokers who wish to quit the habit. In line with this, the researchers also underscored the role of accessible and affordable education in reducing tobacco use, particularly among low-income sectors. Finally, a periodic review of the implementation of the non-price tobacco control measures, such as banning smoking in public places and printing graphic images and warnings on cigarette packaging, were recommended in order to increase their effectiveness in reducing tobacco consumption in the country.

Dr. Myrna Austria is a University Fellow and full professor of the School of Economics.

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HOW CAN OPEN AND DISTANCE LEARNING SUPPORT STUDENTS WITH DISABILITIES?

UNESCO seeks to make higher education institutions with open and distance learning (ODL) more inclusive for learners with disabilities, and it taps DLSU to spearhead the pilot research to be replicated across the globe.

LEARNING FOR ALL



In 2017, De La Salle University embarked on a pilot project for the United Nations Educational, Scientific and Cultural Organization (UNESCO), which seeks to support learners with disabilities under its global thrust Education For All. The focus of the study is on open and distance learning, otherwise known as ODL—an approach to education and training that frees learners from the constraints of time and place through the use of Internet-based information technologies. The main goal of the study is to determine whether higher education institutions that offer ODL considered learners with disabilities in the development of their programs *vis-à-vis* the integration of technology.

The research project was a big, exciting challenge for a group of faculty members from the Br. Andrew Gonzalez FSC College of Education (BAGCED), which was chosen from around 30 project teams representing various universities across the globe.

The project lead, Dr. Ferdinand Pitagan, is concurrent chair of the Educational Leadership and Management Department (ELMD) and director of Academic Support for Instructional Services and Technology. He specializes in Educational Technology. His co-researchers are: Jasper Vincent Alontaga and Maria Corazon Colendrino, who are both ELMD faculty members and PhD students in Special Education, and BAGCED Dean Dr. Voltaire Mistades, who specializes in Administration and Science Education.

For their research, the team referred to the 12 categories of disabilities under the US Individuals with Disabilities Education Act (IDEA). They clustered these into five: physical disabilities subclassified into neurological and skeletal; sensorial disabilities subclassified into hearing impairment, visual impairment, or a combination of the two; behavioral disorders subclassified into externalized disorders like aggression, or internalized disorders like anxiety and mood disorders; and neurodevelopmental disabilities that include ADHD, autism spectrum disorder, and learning disabilities of dyslexia, dyscalculia, and dysgraphia.

The project introduces DLSU faculty members to inclusive education practices. While the University already caters to learners with hearing impairment, it has yet to accommodate those with other disabling conditions. As usually the case, not all students declare disabling issues during enrolment and the teachers have no way of knowing which ones would need particular adaptations.

“We have very strict rules regarding access of data on students with disabilities—we need the approval of the students, their parents, and the admissions office. We have conferred with the legal office on how to proceed cautiously with the data gathering,” Pitagan explains. The program eventually seeks to extend inclusive education practices even to those with undeclared issues.

He shares that in the initial phase of their research, they conducted a program orientation for 22 departments of DLSU. The participants attended seminars on open and distance learning conducted by Pitagan, on disabilities conducted by Colendrino, and on Universal Design for Learning (UDL) conducted by Alontaga. The participants experienced how to use UDL in syllabus development, making it more accessible to learners with disabling conditions.

Colendrino, who has bilateral deafness and spine issues, plays a key role in the project. “With her, the heart for the project is there. Every time she would talk to the participants, they have instant connection,” Pitagan notes.

For his part, Alontaga says that his role in the project is to help teachers redesign their lessons based on the concept of UDL. He explains, “UDL is a principle that outlines what we can do to ensure that our instructions would cover the widest possible range of audience.” He points out that often, teachers would design a lesson with the notion that one lesson fits all students. In reality though, students are very diverse, so teachers have to be mindful of how they present information, how knowledge is represented, and how they engage students in the lessons.

Part of the training conducted by the team oriented the participants on free or open access resources. These are technology options that teachers can use and integrate into their lessons to make their lessons universal.

What the team noted is that the principles of UDL are aligned with DLSU’s student-centered teaching principles, and that a number of the participants have already been

applying these in their face-to-face classes as well as in their online distance learning courses, albeit they were not aware of the UDL tag.

For the research team, the highlight of the initial training with the teachers was finding them captured by the UDL concept as they become more aware of the types of learners as well as the varied options that will engage them in knowledge-generation.

Ultimately, the DLSU team will provide to UNESCO concrete actions and recommendations for other HEIs and ODL communities, policy and decision makers, as well as quality assurance and qualifications recognition bodies. With a baseline research that can be replicated or used as reference around the world, HEIs are a step closer to making ODL inclusive for all learners with disabilities.



The DLSU team for the UNESCO project is composed of Dr. Ferdinand Pitagan, Jasper Vincent Alontaga, Maria Corazon Colendrino, and Dr. Voltaire Mistades from the Br. Andrew Gonzalez FSC College of Education.

WHY IS MICROBIAL DRUG RESISTANCE AN ISSUE OF PHILIPPINE PUBLIC HEALTH?

In a series of studies, University Fellow and 2017 Metrobank Foundation Outstanding Filipino Dr. Esperanza Cabrera of the Biology Department has teamed up with various Philippine institutions and hospitals to determine how microbial drug resistance impacts our healthcare systems.



HEALTHCARE ADVOCACY



For the human eye to see bacteria, they have to be magnified at least 400 to 1,000 times under the best possible conditions for optics. While these organisms are miniscule, they can pose serious threats to our health. And the threat becomes even graver when bacteria develop resistance to antimicrobial agents. Through the years, the World Health Organization has relentlessly sounded the need for vigilance and the establishment of concrete measures to address the rapid emergence and spread of antimicrobial resistant bacteria. The issue of microbial drug resistance is often overlooked in the country, thus leaving more room for these organisms to thrive and be disseminated. Together with some institutions and hospitals in Metro Manila, DLSU University Fellow Dr. Esperanza Cabrera and her students have been studying the resistance profiles and genetics of healthcare and community acquired bacterial pathogens, such as methicillin resistant *Staphylococcus aureus* or MRSA.

MRSA commonly causes skin diseases such as boils or “pigs”, which could be very uncomfortable and painful. At the same time, MRSA is highly infectious and invasive, and can infect the bloodstream, lungs, heart, bones, and joints, etc. if not treated properly.

Compounding the problem is the resistance of MRSA to all commonly available β -lactam antibiotics, which are the most widely used drugs for various bacterial infections. Many strains are likewise resistant to other classes of antimicrobial agents. MRSA has been found to be involved in healthcare-associated infections, such as in hospitals and nursing facilities, as well as in community-acquired diseases such as in the home, prisons, and similarly crowded places. MRSA raises the risk of spreading within communities if precautions are not taken. In the Philippines, the spread of infections caused by antimicrobial resistant bacteria, especially multiple drug resistant strains, could be partly attributed to a glaring knowledge gap in our healthcare systems and among the public. Cabrera emphasizes that medical providers must be at the frontlines of prevention by being more judicious with antibiotic usage. “Studies show that very often, doctors overprescribe, either because he incorrectly thinks that this is the proper management, or because he wants the patient to be content that a treatment was given. The inappropriate antibiotic may also be prescribed if the doctor is not familiar with the common antimicrobial resistance profiles of the bacteria being targeted. The result here is

that when antibiotics are not used correctly – and this is quite rampant in the country– the susceptible bacteria are the ones that are eliminated, and the resistant ones remain, and are the ones that are disseminated. There is also the widespread practice of self-medication among the public since the sale of antibiotics is not strictly regulated. Physicians must be reminded and the general public must be educated on the proper use of antimicrobial agents,” Cabrera explained.

Aside from the spread of antimicrobial resistant microorganisms as a result of indiscriminate use of these drugs, the healthcare setting may also set the stage for the spread of infectious microorganisms. Part of Cabrera’s research includes studying microorganisms in bioaerosols that were isolated from air samples from the operating room, ICU, nursery, and emergency room. These microorganisms could be acquired by humans through different means such as through inhalation, and hospital equipment and materials like catheters, respirators, and other invasive devices. In addition, Cabrera points out that healthcare providers themselves are very common carriers of microorganisms, which can be transmitted among patients within

the hospital, and even from the hospital to the community. Healthcare workers themselves might not be aware that they are bringing home these microorganisms. Cabrera’s studies also cover the mechanisms of microbial drug resistance, since the genetic elements for many of these are transferable from one bacterium to another. “We have been studying those with the more novel mechanisms of drug resistance which are very often not diagnosed in hospitals. These are the ones identified by WHO to be areas of serious concern. This would have a bearing on how the transmission of this kind of microorganisms is controlled, especially the way antimicrobial agents are prescribed to the patients. Because of this, there is really a need to study the resistance mechanisms more deeply. You don’t just limit yourself to knowing what drugs your microorganisms will respond to,” she adds. The resistance genetic elements can be passed on from one organism to another: If a drug-susceptible bacterium receives a particular genetic material coding for resistance from another bacterium, then the susceptible one is converted into a resistant strain. When this happens, antimicrobial agents– including highly potent carbapenems– wouldn’t work or would have no effect on these bacteria.

The studies conducted by Cabrera and her students have resulted in improvements and updates in hospital processes, including sanitation and infection control. “We give the results to the different infection control committees of hospitals every time we have results, so they can take extra measures and prevent the transmission of diseases in these different areas,” she shares. “The studies are very well-received because we’ve published them and have given the proper feedback. These findings are disseminated among stakeholders or people of interests such as doctors and administrators of hospitals.”

The information gleaned through Cabrera’s study also leads to more accurate medical prescriptions. “Based on the results that we get, doctors are advised on what would be the best to prescribe during a certain period.” This way, infectious diseases are treated correctly and the risk of microbial drug resistance is lessened.

Dr. Esperanza Cabrera is a University Fellow and 2017 Metrobank Outstanding Filipino. She is best known for her socio-civic work with the New Bilibid Prison and the Manila City Jail, where she and her team were able to address outbreaks of MRSA infections among the inmates.



DID YOU KNOW...?

The regular and frequent use of household items with antimicrobial agents–such as hand soaps, dishwashing liquid detergent, and lotions, – can do more harm than good. Instead of eliminating all bacteria, the susceptible strains are killed, while the antibacterial-resistant ones survive and are at risk of spreading.



HOW ARE THE CHILDREN OF OFWs COPING?

An ongoing faculty research under the University Research Coordination Office looks into the lifestyle practices and health conditions of adolescents left behind by OFW parents, in a bid to understand their plight and determine the support they need.

SOCIAL SUPPORT

A survey on overseas Filipinos in 2017 revealed that there are more than 2.3 million OFWs scattered all over the world. This was more than double the figure a decade ago when they were estimated at 1 million. Despite the widespread news on the increasing incidence of human rights abuses in some foreign countries, it is projected that more countrymen will continue to seek job opportunities abroad due to the promise of better wages and improved living conditions back home.

The diaspora has brought about numerous problems to the families left behind by the OFWs. Some of these have serious consequences, especially to the young and teenage children who are considered to be the most at risk.

This is the focus of Behavioral Sciences Associate Professor and Department Chair Dr. Myla Arcinas in her study “Lifestyle practices and health conditions of adolescents left behind by OFW parents: Association with the personal characteristics of care providers.”

“In mid-2000s, I got interested in the feminization of migration and observed negative impacts on the health conditions of children left behind by OFW-mothers. My interest then moved to the social cost of migration, looking on the effects of migration to children. And with that, particularly looking at how they cope, how it affected their lifestyle, and how their overall health conditions were.”

Arcinas surveyed 400 adolescents aged 13 to 17 who have a parent or both parents working as OFWs. She visited five schools in the two most populated communities in Calamba City, Laguna, which is identified as one of the top three provinces with the highest number of overseas Filipinos.

The respondents were classified into father away adolescents, mother away adolescents, adolescents with both parents away. Five specific health domains were examined: physical, psychological, emotional, social, and spiritual.

Overall, findings show that the adolescents rated themselves to have a good health condition, with their physical and psychological health as very healthy, emotional health as healthy, and social and spiritual health as moderately healthy.

Results noted variations on how the children cope with their condition. Arcinas shared that children with mothers away tend to have more difficulty coping up with their conditions compared to those with fathers away. “In a father away condition, you have the mother serving as the care provider and because of that, the mother can still guide them with a dual role that the mother performs to cope with the condition with the father working abroad.”

She added that when the father is away, the daughters usually help the mother cope with the situation. However, the professor observed difficulty on the part of the sons with their socio-emotional health conditions with the absence of the father. “Many of the sons have difficulty in communicating their hopes and aspirations with their mom which they feel they could express more with the father.”

For adolescents with the mother away, their physical and spiritual health suffer the most. The children tend to have a hard time attending to the basic needs at home such as the preparation of food. The absence also affects their ritualistic performance or expressions of their faith.

In situations when both of the parents are away, the extended family serves as the substitute parents. Most of them are female, usually the grandmother or aunts. Arcinas noticed a big decline in the social and emotional health of the children, and big negative impact on their spiritual health. “While the extended family is attending to them, the absence of the parents is still very much felt by the kids.”

Moreover, the research noted that extended family are usually from the blood line of the parent away. If the mother is the one away, the substitute parent would come from the family of the mom. On the other hand, when the father is away, there is not much intervention of the extended family since the mother is present. The study also revealed that the extended family who could provide more support to the adolescents are usually the more educated.

Despite their family set-up, a number of adolescents still would want to work abroad. Daughters shared that they would also like to work overseas but different from the type of work of their mother. Among the sons, the main motivation for them to follow their father is their desire to have a role model. Like their counterparts, they also

want to obtain a job position that is better than their parent's. Moving forward, Arcinas is in the process of finding an external agency in order for her to continue the study. She added that there is another study that looks into 18-year-olds and above left behind by OFWs. “I would like to pursue the research to determine the lifestyle practices of OFW children in the older years.”

In closing, Arcinas highlighted the need for such studies: “We cannot undermine the OFWs’ contribution to society. It is incumbent to better understand their situation and their family’s condition and extend help to address their concerns.”

OFWs by the numbers

(Source: 2017 Survey on Overseas Filipinos)

No. of OFWs: 2.3 million

Female: 53.7%

Male: 46.3%

Top age group: 30 – 34 years old

Top destinations: Saudi Arabia, United Arab Emirates, Hong Kong, Kuwait, and Europe

Occupations

(Breakdown based on those surveyed)

- Managers - 1.1%
- Professionals - 8.7%
- Technicians and associate professionals - 5.8%
- Clerical support workers - 3.4%
- Service and sales workers - 18.0%
- Skilled agricultural forestry and fishery workers - 0.4%
- Craft and related trade workers - 11.4%
- Plant and machine operators and assemblers - 13.7%
- Elementary occupations - 37.6%

Total remittance: P205.2 billion

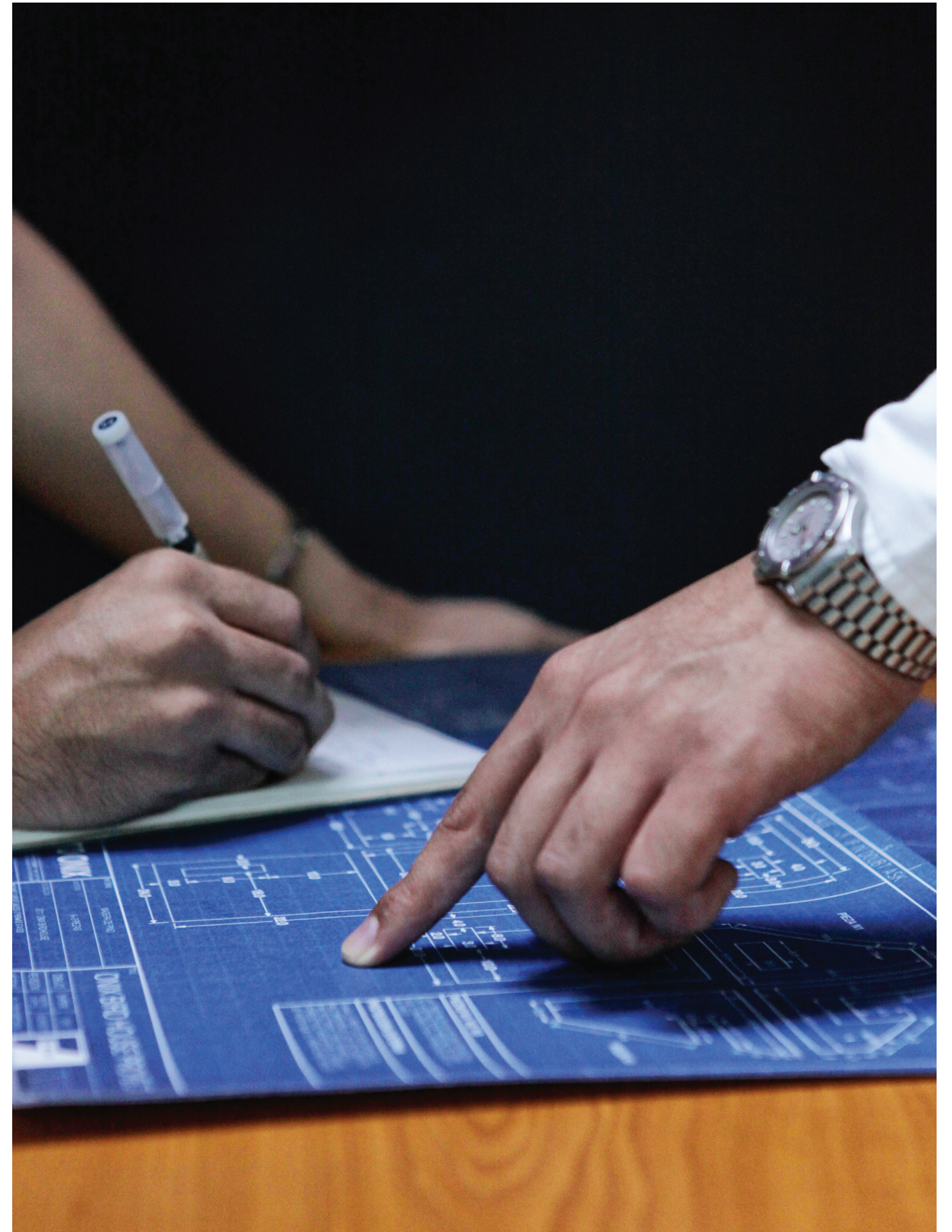
(April to September 2017)

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ARE WE READY FOR MULTI-HAZARDS?

DLSU researchers partner with University College London's EPICentre in a bid to make Philippine schools resilient when natural hazards strike.



RESILIENCE TO MULTI-HAZARDS



On March 11, 2011 while teaching at an international school in Japan, De La Salle University Civil Engineering faculty member Dr. Lessandro Estelito Garciano experienced and witnessed how Japanese school children evacuated from their school when a magnitude 8.0 earthquake hit Tokyo: they moved together calmly and quickly, had clear direction, and acted accordingly. For a disaster of that magnitude, the children were kept safe due in large part to the built-in preparedness of the school system.

That experience as well as similar occurrences in Japan, although in lesser magnitude, have inspired him in his continuing research work, with his interests mainly on wind, earthquake and flood hazard mapping, Bayesian updating methods, risk assessment, reliability theory, and multi-hazard assessment of historical structures, hospitals, and schools.

In 2013, he became part of the ASEP (Association of Structural Engineers of the Philippines) Study team that assessed the situation in Bohol after a magnitude 7.2 earthquake reduced into rubble more than 14,500 structures—including centuries-old heritage structures – and resulted in over 200 deaths, and almost 1,000 injured (estimated figures based on NDRRMC reports).

This urgent need to assess the vulnerability of our national cultural treasures led to the mobilization of consulting firm ARS Progetti SPA (Italy), University of Santo Tomas' Graduate School Center for Conservation of Cultural Property and Environment in the Tropics, the DLSU team of Prof. Andres Oreta, Garciano, and Engr. Kirk Yu, and experts from University College London's (UCL) EPICentre, Prof. Dina D'Ayala, and Dr. Carmine Galasso at the request of the Department of Tourism with funding from the World Bank through the Global Facility for Disaster Reduction and Recovery. The main focus of this work was to conduct a "detailed vulnerability assessment of selected cultural heritage structures to identify, prioritize, and provide initial cost estimates for risk reduction investments for structural strengthening and restoration."

After this project, the UCL and DLSU team shifted gear and focused on schools. XU-ERC (Xavier University-Engineering Resource Centre) led by Engr. Dexter Lo joined the circle. For two years, UCL-DLSU-XU worked on the project Safer Communities through Safer Schools (SCOSSO), looking at the safety of school buildings in the Philippines against natural hazards.



Since buildings are critical infrastructures and are also used as evacuation centers in times of emergencies, these buildings must be assessed for multiple hazards.

Through SCOSSO, they were able to survey more than 120 buildings, which were evaluated for structural and non-structural vulnerability against natural hazards such as earthquake, tsunami, flood, and typhoons. Part of the project was conducting workshops for various stakeholders including government, private, and non-government organizations across the country.

The success of SCOSSO served as the platform to launch PRISMH: Philippines Resilience of School Infrastructure to Multi Hazard project, funded by the British Council's Newton Agham Institutional Links Programme, in partnership with the Commission on Higher Education. Started in April 2017, the project will run until April 2019.

Garciano points out that PRISMH seeks to advance the assessment and evaluations of the schools, which are exposed to multi hazards. "Some areas are more prone to typhoons, some areas are more prone to earthquakes,

some areas are more prone to flooding, etc. Because each area's requirements are unique, the response should be tailor fit," he says.

The PRISMH team adopts two measures to better equip school communities, Garciano shares. One is called soft measures, which include the development of early warning systems and evacuation materials. The other is called hard measures, which involve analyzing the infrastructure, including its blueprints and integrity. The team provides recommendations on how to improve the structure at risk.

Currently, they have identified three school locations to review. One is in Tacloban, an area identified for typhoons, Cagayan De Oro for flood, and Surigao for earthquakes. These locations were selected based on the frequency of multi-hazards. In February 2018, they conducted another workshop with the Department of Education personnel on the topic of disaster resilience.

"Our school children are vulnerable to these natural hazards. But if the students in Japan can respond accordingly to earthquakes, we can also do it," he says.

Dr. Lessandro Estelito Garciano is chair and associate professor of the Civil Engineering Department of the Gokongwei College of Engineering.

DID YOU KNOW...?

A study conducted by the Geneva-based United Nations International Strategy for Disaster Reduction and the Belgian-based Centre for Research on the Epidemiology of Disasters shows that the Philippines over the past two decades experienced a total of 274 natural calamities. The Philippines is the fourth most disaster prone country in the world. The Philippines is also in the Top 10 in terms of people most affected during calamities.

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HOW CAN WE PREVENT A DENGUE OUTBREAK?

To help monitor and control the population of the dengue-causing mosquito *aedes aegypti*, experts from DLSU's College of Science and College of Computer Studies collaborated to develop an automatic surveillance trapping system with the most efficient attractant.

TECHNOLOGY FOR HEALTH

Different prevention and control programs are being implemented in the country to reduce morbidity and mortality from dengue infection, one of the most prevalent diseases in the Philippines. In a bid to make the country's fight against this disease more effective, a faculty group of researchers from De La Salle University is taking a holistic approach to the challenge.

Dr. Divina Amalin, head of the Biological Control Research Unit under the College of Science Center for Natural Sciences and Environmental Research, is currently developing a more efficient integrated vector monitoring system (IVM) to help control the population of the dengue causing mosquito, *Aedes aegypti*. IVM is a measure that would manage the population of mosquito vector carrying dengue disease using combination control measures.

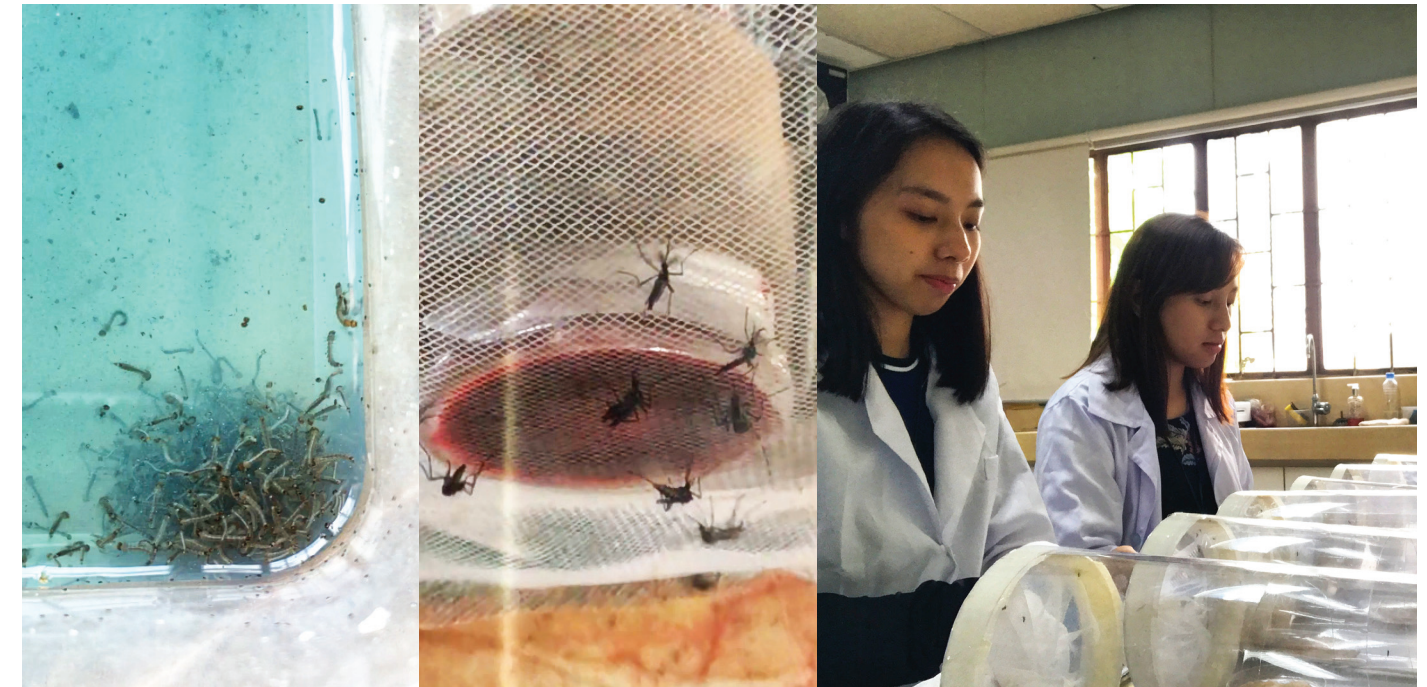
Amalin's IVM proposal has three components - automated population monitoring system, the use of biological control agent to control mosquito population, and the development of bio pesticide that will kill the larvae of the insect.

An integral part of this program is the inclusion of an efficient monitoring system to monitor the seasonal population of the insect. To do this, she collaborated with the College of Computer Studies (CCS) Center for Automation Research Group, headed by Clement Ong.

The CCS team created a computer system of automatic trap with IR phototransistors that is programmed to automatically identify whether the insect caught is a mosquito or not, based on wingbeat sensing. The system also includes the monitoring of environmental conditions such as time and weather that are very beneficial to entomologists.

Ong shares that the device they developed is called ARTiST, which stands for automatic real-time surveillance and trap. It can automatically detect and record if the insect that entered the trap is a mosquito or not. This makes way for an easier data collection for entomologists. He adds that in a traditional system, a mosquito trap is set up in the field and entomologists have to manually count and verify the number of mosquitoes among the different insects that were caught.

On the other hand, Amalin's team, which includes Daniel Stanley Tan of the Software Technology Department and Robert Leong of the Mathematics Department, tested which oviposition attractant, a chemical from a material that will attract the gravid female mosquitoes to lay their eggs, is the most efficient.



Based on the initial results of the study, the most efficient attractant is the bamboo tea infusion. It significantly catches more female gravid mosquitoes compared to the wood bark strip and carbon dioxide, with water serving as the control check of the experiment.

The bamboo tea infusion will be included as the attractant in the automatic surveillance trapping system as a means of monitoring and controlling the population of dengue mosquitoes. Monitoring the mosquito population would help in forecasting the spread of the virus that can be correlated in the cases of dengue in different areas of the Philippines.

For next year, the team intends to pilot test the oviposition attractant with the final product design of the ARTiST. They also plan to identify possible adaptors of the automated device, such as government health agencies.

The study Building an Automated Counter of Adult Mosquitoes for Entomologic Surveillance is composed of groups that focused on the two components of the project.

- Mosquito attractant evaluation: Dr. Divina Amalin, Biology Department; Robert Leong, Math Department; and Daniel Stanley Tan, Software Technology Department
- Development of the mosquito counter device: Clement Ong, Computer Technology Department; Rhaniel Robert Sy, Christopher Edmund Wong, and Lemuel Aaron Lalic, BSCS Major in Computer Systems Engineering

HOW DO WE SELL FILIPINO CRAFTSMANSHIP?

A case study from the Center for Business Research and Development explores the effectiveness of CITEM's Design Philippines branding development program for Filipino furniture exporters.



BRAND BUILDING



When the Center for International Trade Expositions and Missions (CITEM) started the program Design Philippines in 2013, it was intended to provide support to key players in the furniture export industry. Now five years later, CITEM wants to know: was the program successful in building up Philippine brands in the international market?

Four local brands that participated in the Design Philippines program seem to think so. In a commissioned case study under the DLSU Center for Business Research and Development, Associate Professor Dr. Raymund Habaradas, Associate Professor Reynaldo Bautista Jr., and Assistant Professor Paz Esperanza Poblador explain in detail how CITEM's program contributed to the growth and profitability of four local furniture exporters. The companies that were reviewed and examined in this study are Industria Edition, Ito Kish, Schema, and Triboa Bay Living.

While all four companies generally consider Design Philippines as a successful program, they differ in terms of how the program actually contributed to their business. This is because CITEM's brand development program offers various intervention strategies for different types of exporters. In the case of Industria Edition, for example, CITEM's subsidy of the company's participation in international trade fairs provided considerable exposure abroad, which eventually translated to increased sales.

One of Design Philippines' priority objectives since 2013 is to provide local companies with better exposure in the international market via several prominent international design shows such as the Salone Internazionale del Mobile in Milan, MAISON&OBJET Paris, and the International Contemporary Furniture Fair in New York City. CITEM subsidizes the participation of select local companies in these fairs under the Design Philippines umbrella campaign, in an effort to market the Philippines as a destination for high quality furniture and craftsmanship.

Jerry Jiao, Jr. of Schema explains how Design Philippines helped the company during the early stages of its branding journey: "Through Design Philippines, we were able to experience how it is to join the biggest fairs in the world... [So] with the exposure we got from Design Philippines, we felt the need to really present Schema as a lifestyle brand. Because of the lifestyle presentation, the more they appreciate the lighting... Aside from getting buyers, designers worldwide took notice of our techniques and our products. There were good designers who talked to us and offered their services. They collaborated with us. So that started a new dimension."

Aside from providing exposure in international fairs, CITEM also developed an export coaching program under Design Philippines to provide companies with the technical knowledge in the furniture export industry. Since 2013, CITEM has organized sessions and workshops on branding, compliance, brand sustainability, and new market exploration, among others.

For Ito Kish, it was the Design Philippines' export coaching program that helped his company improve its branding, which included producing professional collaterals such as catalogues for international exhibitions.

In the case of Triboa Bay Living, it was when Design Philippines encouraged them to review their old business model and subsequently adopted a new one that made them more profitable as compared to 10 years ago.

While all four businesses are in consensus as regards the success of CITEM's branding initiative, they still have a few recommendations that the government arm may consider in moving forward, and that is: to be more selective of the companies that should participate in the program; to formalize the mentoring scheme; and to provide additional logistical support for the exporters during international trade shows.

In doing this study for CITEM, Habaradas provides his own insight as to how local businesses can succeed in a global landscape.

"When we talk about businesses, it is important to overcome what we call organizational inertia—in simple terms, they must innovate, they must come up with new products and services, they can enter new markets, or they can re-examine their business models altogether. Only then will they be able to increase their chances of survival and continued growth."



Dr. Raymund Habaradas is an associate professor of the Management and Organization Department of the Ramon V. del Rosario College of Business. He is currently the director of the DLSU Center for Business Research and Development.

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*Palibhasa'y nanggaling ka sa hanay nang maliliit
Sa kawal ng manggagawang taga-nayon, taga-bukid,
Kaya'y ikaw'y hinahamak sa layon mo't gintong nais
Katulad mo ay bilanggong malabis na inuusig;
Hindi ibig na makitang tumuntun ka sa matuwid
Hindi ibig na makitang idilat ang matang-pikit;
Hindi ibig matanglawan ang diwa ng nahahapis,
Ibig nilang masusian ang matapang mong panitik!*

Serafin C. Guinigundo, "Inuusig sa Matuwid," Pahayagang Sakdal
Ika-3 ng Nobyembre, 1934, p. 1. Mula ang may akda sa San Miguel, Bulacan.

WHAT DO WE KNOW WHEN WE KNOW A REVOLUTIONARY'S POETRY?

A historical research by a DLSU faculty member sheds light on Sakdalismo—a political movement in the 1930s that fell from popularity to ignominy—through the poetry of its members and shares lessons for the current generation.

LESSON FROM HISTORY



During the latter stages of the American colonial period, a popular grassroots political party known as Sakdal (Lapiang Sakdal) presented a strong challenge to the mainstream politics of its day and even threatened to topple the established order. Swept in the shadows of the nation's memory by the turn of the 21st century, the Sakdalistas and their poetry today come to light in the recently released book *Tulang Sakdal: Aral at Diwa ng Sakdalismo*, authored by Dr. Marlon Delupio, faculty member of the Department of History at De La Salle University.

Delupio explains that the word “sakdal” means “to strike” or “to accuse” (Newspaper tag line is “Malaya, Walang Panginoong kundi ang Bayan”) and characterized the nature of the movement, which levied criticisms at both the ruling Filipino elite and the American colonial regime. The Sakdalistas would characterize the Filipino elite as compromised and corrupt while leveling charges of hypocrisy and oppression at the American colonial regime for not immediately giving the Philippines its independence and creating a situation wherein the country would remain subservient to America.

Writing the book after completing his PhD degree in History, Delupio saw the Sakdal movement as an interesting topic for further study and exploration. He was able to compile and study 160 poems produced by the general membership of the organization, a portion of which can be found in his book. He found clippings of articles from the movement's newspaper, *Ang Sakdal*, and interviewed relatives of former members to form a rich and nuanced understanding of the organization, their goals, philosophy, and aspirations.

What he found from his investigation was a nationalistic movement whose members were composed of ordinary, working class Filipinos (farmers and laborers). They were led by a charismatic and idealistic young man by the name of Benigno Ramos. The Sakdalistas and Sakdalismo, as an ideology, would become another force in Philippine politics and present a legitimate challenge to the leading political parties of the time: the Demokrata, Komunista, and the Nacionalista Party. The last was the most dominant and was then led by Manuel L. Quezon.

According to Delupio, the movement emerged from two key incidents. The first was related to the death of a Filipino lettuce picker in California while the second incident involved American teacher Mabel Blumitt, who racially discriminated Filipinos as “monkeys” who ate nothing but sweet potatoes. The founder and leader of the Sakdal movement, Benigno Ramos, who himself was a son of a Katipunero and whose mother served as a nurse during the Revolution of 1896, was drawn to the protests. As he was a high-level member of government, widely seen as a prodigy, if not a protégé, for he was personally close to Quezon, he was given an ultimatum: dissociate from the protests and return to the fold or leave government service. Ramos chose to side with the protesters instead. He soon established the Sakdal Newspaper (June 18, 1930) and the movement with it, and later the Lapiang Sakdal (Oct. 29, 1933) which would go on to perform strongly in the 1935 general elections.

In his book, Delupio highlights how the movement articulated its yearning for a free and independent Philippines through poetry and their writings as communicated in their newspaper *Ang Sakdal*. This dedication to country was summed up by a thought common to the Sakdalistas: “Fear nothing but God and country!” They saw themselves

as a direct continuation of the struggle for independence during 1896.

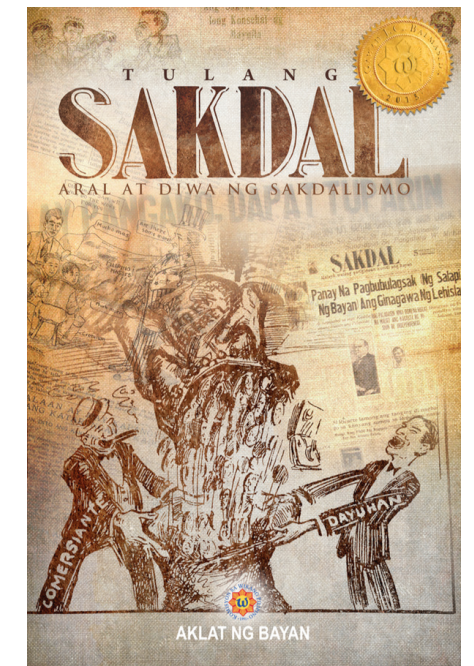
Despite being from the lower strata and perceived as “uneducated”, the Sakdalistas, who were mostly farmers and laborers, wrote lengthily about love of country and how the ruling class was misleading the masses. They also took exception to a feature in the proposed post-colonial constitution which allowed for America to retake control of the country should the Philippines “fail” in self-governance.

Delupio notes how the poems—some of which about 15 to 25 stanzas long—displayed the depth of thought and complexity of social consciousness by the writers. The Sakdalistas campaigned for social justice, development of the common man, all of which will be attained by complete and absolute independence of the Philippines from the United States. Likewise, they pushed for the development of Tagalog as a national language and enriching a shared Filipino cultural identity. They underscored public good, calling on public servants to lead simple and moral lives.

In the course of their movement, however, the party suffered from a failed revolt (May 2-3, 1934) that diminished its followers and sympathizers. Later, its collaboration

with the Japanese occupation force during the second World War led to the characterization of the Sakdalistas as traitors, troublemakers, and fanatics in later decades. Along the way, they were also branded as communists which, according to Delupio, was far from the truth as they had a simpler ideology grounded in nationalism and love for country and people.

As a historian, Delupio expresses hope that his research about the Sakdal movement would help inspire the youth to take a more active stance about the issues of the day and engender a love for country that would equal, if not surpass, the devotion to country shown by the Sakdalistas.



Dr. Marlon Delupio is a faculty member of the Department of History. The book, which won the grand prize Gawad Julian Cruz Balmaseda in 2015, was published by the Komisyon sa Wikang Filipino and Pambansang Komisyon para sa Kultura at mga Sining.

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WHY MUST WE ASSESS OUR CORAL REEFS?

University Fellow and Br. Alfred Shields FSC Ocean Research Center founding Director Dr. Wilfredo Licuanan, teams of marine biologists, and researchers from various disciplines and universities, conduct a national assessment of Philippine coral reefs to know their current state and health.



MARINE LIFE PROTECTION



The Philippine archipelago comprises 7,641 islands and is home to some of the world's most biologically diverse coral reefs. Researchers have found 505 coral and 915 reef fish species in the country's rich waters. Outranked only by Indonesia and Australia, the Philippines is also the world's third coral-rich area, with 25,000 square kilometers of reef systems. Given how coral reefs are a huge part of the country's geography and pool of natural resources, it's only apt that a national assessment of it is conducted.

In 2014, DLSU University Fellow Dr. Wilfredo Licuanan and collaborators from different academic institutions conducted the Nationwide Assessment of Coral Reef Environment (NACRE). The 93 million peso program funded by the Department of Science and Technology - Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST- PCAARRD) was the first reef assessment in 40 years.

"Since the last assessment was done in the 1970s, led by Drs. (Edgar) Gomez and (Angel) Alcala, who are now both National Scientists, there was an urgent need for an update," shares Licuanan. "The work of Drs. Gomez and Alcala showed that 5% of the reefs they surveyed years ago were in the "excellent" category. That means at least three fourths of the surface was covered in coral. When we did our assessment in the last three years, we did not find any of those "excellent" category reefs. It shows there was significant reef loss over the last 40 years and that should be a cause of concern."

NACRE has five component projects focusing on corals, mangroves and sea grass, reef fishes, sedimentation, and decision support. The last three areas were done in partnership with units from the University of the Philippines.

In surveying the country's reefs, Licuanan and his team faced obstacles in logistics. The painstaking task of studying reefs was made even more tedious by the lack of accurate maps. Satellite images proved to be unreliable and the maps, misleading. The project was completed nonetheless and the results gleaned from the studies are now being shared and applied. "What our work also did was shift the paradigm in terms of how reef assessments and monitoring are done. We are now in the stage where we are training people—especially in regional institutions of higher learning, regional universities—on how to do what we did at the national level, in a regional, but more detailed level."

Licuanan and his team have also shared their findings with policymakers, which, he says, is an ongoing effort. "There are some regulations, some rules, including presidential proclamations, that need to be updated because they're still using numbers from 40 years ago. And the use of old numbers does have serious implications in terms of how we select reefs to protect, manage, and develop. If we're going to save our reefs, we need to know where they are and map out the boundaries. We also need to know how they're doing, what's affecting their health. Most importantly, we need to make that information available to the people concerned."

While NACRE has given scientists and policymakers a wealth of information that could help with the conservation of our reefs, Licuanan points out that there is more work to be done. "The next phase is to move away from assessments and move towards monitoring. Why? Assessments tell us what we lost. Monitoring tells us what's going on. Which means there's a potential to still do something, to reverse the damage. We're trying to push that shift now, and again, this is a shift that must involve the coastal communities. We need to train more citizen scientists to do this at the local level and generate timely information in what's happening to reefs. So we're working on that project."

DID YOU KNOW...?

...“Nacre” is the technical term for mother of pearl. This is the shiny part in the inside of shells.

...Some parts of our white sand come from fish poop? A healthy reef produces 1 to 5 kilograms of white sand every square meter, every year. White sand is essentially ground up coral skeleton. One of the organisms that help grind it down are large parrot fish that munch on coral and the sand they are not able to digest comes out of the other end of those fishes.

Dr. Wilfredo Licuanan is a University Fellow and founding director of the Alfred Shields Ocean Research Center. He is a recipient of the NAST Environmental Science Award.

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MARINE RESOURCE ENHANCEMENT PROJECT

The DLSU Br. Alfred Shields FSC Ocean Research Center (SHORE), in partnership with local governments and non-government organization Pusod Inc., pursues the rehabilitation of coastal areas in the Philippines. It is initially implemented in Lian, a town in Batangas province that lies at the south of Metro Manila. The Marine Resource Enhancement Project will be replicated in the neighboring coastal shores of Nasugbu.

The project has two main components: The first part involves training and seminars for local government officials and members of the community—to enable them to become more aware of their roles and responsibilities in the project, as well as opportunities in their monitoring their own reefs. The second part involves the construction of concrete artificial habitats, which will serve as fish feeding and hiding places. These structures are also meant to provide surfaces for baby corals to settle on.

SHORE's Dr. Wilfredo Licuanan shares that the project has generated jobs and opportunities for the town's fishers, who are encouraged to be proactive in the protection and management of their marine resources. Guided by the concept of adaptive management, he sees the project as a way to constantly learn from and a challenge to iteratively improve on.



WHAT'S NEW AT DLSU LAGUNA CAMPUS?



RESEARCH PROJECTS BY DLSU LAGUNA FACULTY



1. Fabrication of Metal Oxide VOC (Volatile Organic Compound) Gas Sensors for Lung Disease Applications by Dr. Gil Nonato Santos

With a Php5 million grant from USAID Stride AGILA, the research project was conducted in collaboration with Integrated Micro Electronics, Inc. (IMI) from March 2017 to March 2018.

The study seeks to provide a point-of-care detection tool for patients with lung disease. With its non-contact mechanism, it offers medical personnel a simple, faster, and safer way of diagnosing patients with lung disease. Its proposed device is intended to be portable and cost efficient, to help improve health care services in the country.

2. Development of a Flight Controller for a Modular UAV System by Dr. Alvin Chua

This Php12.8 million research project is funded by the Department of Science and Technology's (DOST) Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD), and conducted in collaboration with FEATI University and Ateneo De Manila University. Started in May 2017, its target completion is May 2019.

The research project involves the development of a local flight controller for an Unmanned Aerial Vehicle (UAV). It seeks to support programs such as search and rescue,

disaster prevention, mitigation and preparedness, and infrastructure monitoring.

3. Biological Control for major Cacao pests and diseases by Dr. Divina Amalin and Dr. Alberto Barrion

With a research grant from DOST's Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD), the researchers explore and identify, mass rear, and release biological control agents against cacao pod borer (CPB) and cacao mirid bug (CMB). The use of biological control has become a very promising alternative to the more traditional use of chemical pesticides in agricultural pest management. It uses other organisms in controlling pests, which can be insects, mites, weeds, and plant diseases, through predation (i.e., organism preying on the pest), parasitism (i.e., smaller organism causing harm on its host organism), or other natural mechanisms.

4. GPS-Guided Smart Go-Kart with Obstacle Detection by Carl Vinson Matulac (BS-ECE), Marc Douglas Sierzo (BS-ECE), and Raven Soliguen (BS-ECE), with thesis adviser Engr. Alexander C. Abad, PECE

This smart vehicle system is capable of both manual and automatic drive. It is a GPS-guided smart vehicle adapting a Go-kart design, with obstacle detection and avoidance system. It can transport one person and can also be used as a delivery cart. It has been successfully tested to roam the DLSU Laguna Campus.

5. Chemical constituents of mushrooms, mosses, cactus, seagrasses, seaweeds and terrestrial plants by an interdisciplinary research group led by Dr. Consolacion Ragasa

The project is conducted under a research grant from the Commission on Higher Education's Philippine Higher Education Research Network (CHED-PHERNet) from April 15, 2018 to April 16, 2019.

The working group is currently working on the chemical constituents of mushrooms, mosses, cactus, seagrasses, seaweeds and terrestrial plants. The project seeks to isolate, identify, and test the cytotoxicity of the chemical constituents of 20 Philippine mushrooms and 56 moss species from Luzon. A PhD student is working on the chemical constituents of Philippine

cactus from Luzon. Another PhD student is working on the chemical constituents of seagrasses and seaweeds

from Bicol region. MS students are working on the chemical constituents of terrestrial plants.

6. Game-based Learning Environments for Conceptual Understanding by Dr. Raymund Sison

This research program involves the design, development, and evaluation of different kinds of game-based learning environments to help deepen conceptual understanding in various subjects and topics.

Currently, two game-based learning environments have been developed and are undergoing playtesting and evaluation—an endless runner game on angles and triangles, and a platform game on fractions. In addition to having core mechanics designed to address learning outcomes, these game-based learning environments also use artificial intelligence to generate and update learner models and provide adaptive interaction.

RESEARCH FACILITIES AT DLSU LAGUNA CAMPUS

Richard L. Lee Engineering and Technology Block

DLSU's hub for engineering research and projects and shared space for industrial activities of other academic disciplines



Dr. George S.K. Ty Advanced Instrumentation Building

A multidisciplinary facility for experiment and lab works, equipped with high precision instruments/equipment and facility for high performance computing



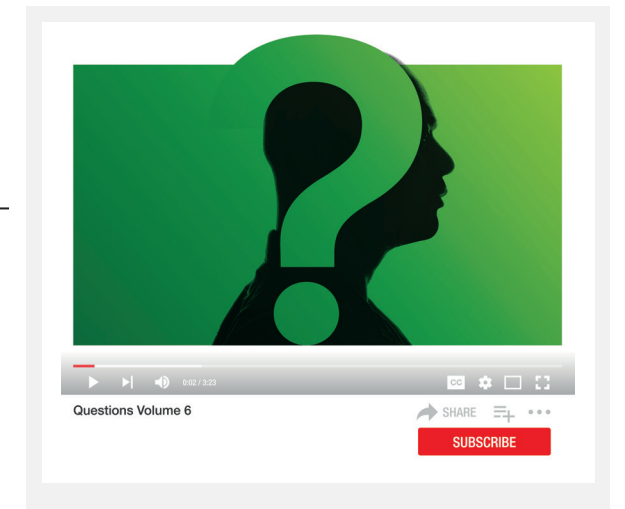
A research lab for the project on biological control of major Cacao pests and diseases

Te³D House: Technology Education Entertainment Empathy Design House is a research hub for BS-CS students.



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<http://www.youtube.com/DLSU100>





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QUESTIONS is published by
the Office for Strategic Communications
of De La Salle University.

2401 Taft Avenue, Manila 0922, Philippines
Issue #6 June 2018

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ISSN 2362-7387



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