



June 2019
Issue #7

DE LA SALLE UNIVERSITY
RESEARCH • INNOVATION • CREATIVITY

Questions



— WE ASK TO —

**KNOW.
ACT.
CHANGE.**

QUESTIONS

This issue of **QUESTIONS** features DLSU research initiatives that highlight the concept of *sagip*, which means save or rescue.

QUESTIONS seeks to 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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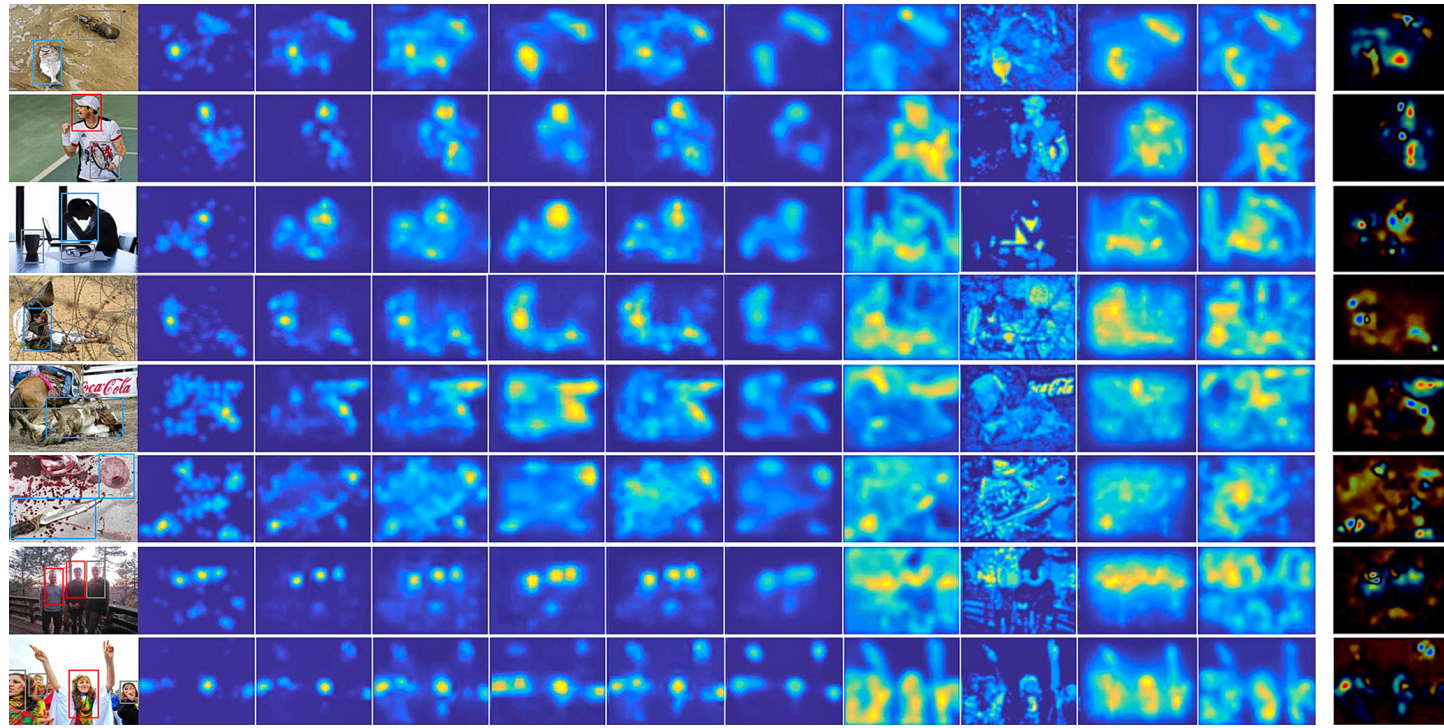
FOOD SCIENCE

What's brewing in the coffee sector?



HOW CAN WE MAKE ROBOTS SEE THE WAY WE DO?

A faculty member from De La Salle University teams up with researchers from the National University of Singapore to develop a computational model that considers how human attention can be predicted, through consensus reactions or sentiments over objects.



Engaged in the field of artificial intelligence (AI) research and development, DLSU College of Computer Studies Associate Professor Dr. Macario Cordel II is working on the application of deep neural network in computer vision.

Simply put, he seeks to develop a part of the complex network of the human brain, particularly that part which responds to vision.

“Teaching how a computer should perform or interpret a scene is a very complex task,” he says. His work is to make the computer mimic how human gazes and make it predict human attention.

Cordel, who recently worked with a group of top researchers from the National University of Singapore, explains that there have been a number of proposed systems which predict human gaze. This is the type of AI that has many applications.

A leading example of AI application is the development of autonomous (or driverless) vehicles. He says, “In order for a vehicle to be autonomous, the vehicle should have the capability to see in the same manner that a driver identifies a road blockage, traffic signs, pedestrians, and other important information in a scene.”

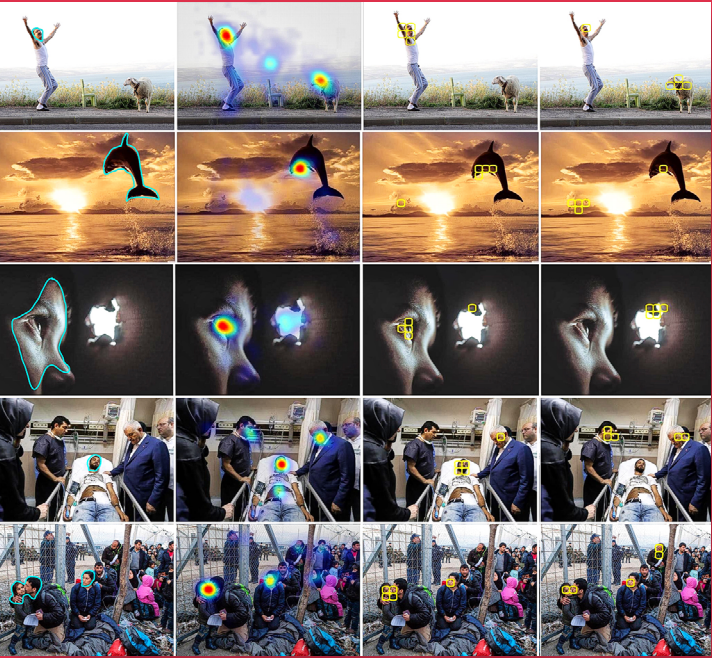
Many existing systems that predict human attention, however, have yet to explore the concept of emotion, which can be evoked by an object within the visual range. In their paper, Cordel and his fellow researchers note that despite the recent success in face recognition and object classification, in the field of human gaze prediction, computer models are still struggling to accurately mimic human attention.

The difficulty lies in various factors affecting attention, from low-level features (e.g., color, contrast) to high-level human perception (e.g., object interactions, object sentiment).



“As far as we know, our work is the first attempt to quantify an object’s attention level while considering human consensus and scene complexity,” he points out.

Looking ahead, he envisions a model that can be used for video analysis or for doing certain tasks. “The computational model for vision will be very beneficial in many fields—for instance, a road monitoring system that can identify abnormal activities such as road accidents, disaster-hit areas, crime incidents, and traffic congestion, and events like rallies or mass protests,” he says. It can also be applied in health monitoring systems as well as the field of advertising.



“Endowing robots with eyes which can identify important objects will be a big step in robotics,” he enthuses. For him, the next step in this field of research should be to allocate more computing resources and to focus the analysis on important parts, thus providing for a faster access and more accurate use of critical applications.

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Deep neural network (DNN) is a computational model based on the human brain’s architecture and development mechanism. It is designed similar to the connection of neurons in the brain, which is made up of several layers. Unlike traditional neural network that is composed of 2-3 hidden layers, DNN can have hundreds of layers that contain millions of neural connections, thus the need for big data and high-performing computing devices.

Computer vision is useful in video analysis in applications such as security cameras, health care monitoring system, and advertising, among many others.

The study, “Emotion Aware, Human Attention Prediction” was written by Dr. Macario Cordel II together with professors Dr. Mohan Kankanhalli, Dr. Shaojing Fan, and Engr. Zhiqi Shen, from the Sensor-enhanced Social Media (SeSaMe) Research Center at the National University of Singapore. The paper is accepted in the 2019 International Conference on Computer Vision and Pattern Recognition, a premier annual computer vision event comprising the main conference and several co-located workshops and short courses. The conference journal is in the first quartile of the SCImago Journal Ranking.

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HOW CAN WE GET MORE 'LIKES' FOR SCIENCE?

DLSU is a hub for global initiative to innovate science education in Southeast Asia.



According to a 2009 UNESCO report, there is a declining interest in science and science careers among primary and secondary students around the world. The study mentioned that learners shun the said subject because it is “disconnected from their own lives, a depersonalized science.” It added that students lose interest because science teaching is heavily transmissive where rigid knowledge comes from the teacher or from a textbook and the students do not have the opportunity to investigate on their own.

A decade since the report, the downward trend of the interest in the field continues and it remains a global challenge. To address this, the Erasmus+ Programme of the European Union supported in 2016 the Action Research to Innovate Science

Teaching (ARTiST). This global initiative aims to reform the curriculum by innovating science education through action research.

The ARTiST project is a partnership of 10 universities namely: De La Salle University, Alpen-Adria-University, Austria; Academic Arab College for Education, Israel; Ateneo de Manila University; Batumi Shota Rustaveli State University, Georgia; Gazi University, Turkey; Ilia State University, Georgia; Oranim Academic College of Education, Israel; University of Bremen, Germany; and University of Limerick, Ireland.

The DLSU research team is headed by Science Education Department Associate Professor Dr. Lydia Roleda, who is also the Assistant Dean for Research and Advanced Studies at the Br. Andrew

Gonzalez FSC College of Education. Her team members are Dr. Maricar Prudente, Dr. Minie Lapinid, and Dr. Socorro Aguja.

“Our goal for this project is to enhance the teaching practices in science education. We want our students to develop interest in science through the creative delivery of our lessons and our innovations will be done under the platform of action research,” Roleda shares.

DLSU’s vast experience in action research proved to be beneficial to the project. The ARTiST team conducted several workshops on action research, with the members sharing their expertise in the field to high school and college teachers and graduate students from all over the country.



ARTiST provided the structure for the courses, training materials, and activities for the higher education institutions involved. Through La Salle’s wide network of academic linkages, the team had access to the teachers and their students. She shares, “Most of our students in our graduate programs are science teachers so we assisted and trained them under this project.” She adds, “This puts us in a position where we can have greater impact on our target recipients. We can work with them more closely.”

The project also allowed DLSU to acquire modern audio-visual and science equipment, including interactive projectors and teaching science instruments. “Our teachers can borrow these instruments and bring them to their classes. They can do activities and alternative experiments to make their lessons more interesting for their students,” says Roleda.

Aside from school partnerships, Roleda notes that an integral part of the initiative is the collaboration with the industry sector. “The plant exposure trips provide relevant experience to the student. During the visit, a company representative gives a pep talk on how his life is as a scientist. This way, he brings his work closer to the students and he becomes more relatable to them. This, in a way, humanizes science.”

As a culminating activity of the ARTiST project, a conference will be held in Georgia later this year which will be attended by teachers and graduate students from partner universities who have

worked on their action researches. Beyond this, the project will continue as the support mechanism is already in place. An official website is set up by the consortium where anyone can access helpful materials in doing action research in science, such as the ARTiST Guidebook. Also, the equipment and the instruments are housed in a center at DLSU, which teachers may still borrow for their classes.

The project team is hopeful that ARTiST will have a positive impact on the delivery of lessons of the teachers of the partner schools. More importantly, they are optimistic that the students will learn to appreciate science more with the innovations introduced by the project.

“Science is an integral part of a country’s development. We hope that, through this project, we can encourage more students to like and be interested science, and they would want to pursue a career in science later on,” Roleda ends.



***** Action research in DLSU

Action research refers to “a wide variety of evaluative, investigative, and analytical research methods designed to diagnose problems or weaknesses and help educators develop practical solutions to address them quickly and efficiently.” (Glossary of Educational Reform). De La Salle University is a leading proponent of action research and has been promoting this all over the country through seminars and training programs.

The Lasallian Institute for Development and Educational Research has been organizing the International Congress on Action Research, Action Learning (ARAL) annually. This international confab brings together experts in the field to analyze, study, and improve current practices that aims to improve the educational landscape in the region.

The DLSU research team is headed by Science Education Department Associate Professor Dr. Lydia Roleda, who is also the Assistant Dean for Research and Advanced Studies at the Br. Andrew Gonzalez FSC College of Education. Her team members are Dr. Maricar Prudente, Dr. Minie Lapinid, and Dr. Socorro Aguja.

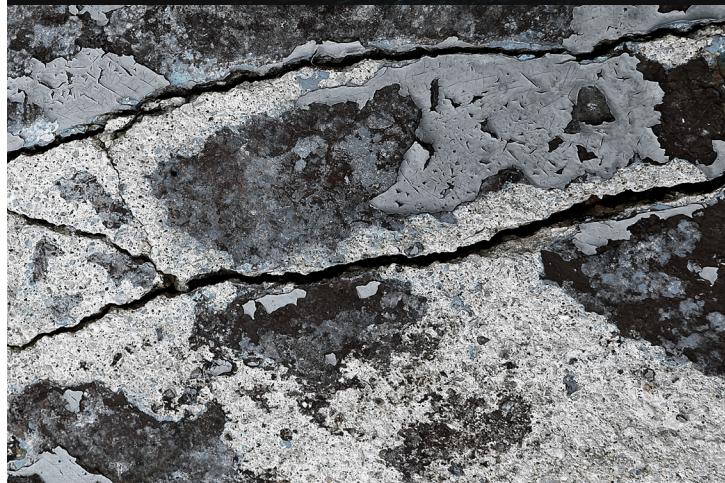
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WHO WILL SAVE US FROM NATURAL DISASTERS?

De La Salle University researchers are working with their counterparts abroad on building the resilience of coastal communities.



The Philippines' position along a typhoon belt and the Pacific Ring of Fire, a vast region where most of the world's earthquakes and volcanic eruptions occur, makes the country prone to natural hazards. The most powerful of these have led to fatalities, billions in loss, damage to property and livelihood, and the displacement of thousands.

With 18,000 kilometers of coastline in the archipelago, coastal communities inhabited by an estimated 50 million Filipinos are particularly vulnerable.

CAPACITY BUILDING WITH HIGHER EDUCATION INSTITUTIONS

In an ongoing project supported by the European Union's Erasmus+ Programme, De La Salle University researchers are working with their counterparts abroad on building the resilience of coastal communities.

Through a series of workshops dubbed "Capacity Building in Asia for Resilience Education (CABARET)," scholars from universities in five European and five Asian nations seek to involve higher education institutions (HEIs) in developing effective multi-hazard early warning systems in vulnerable places in the Philippines as well as in other disaster-prone countries.

FROM SINGLE TO MULTI-HAZARD EARLY WARNING SYSTEMS

The World Meteorological Organization (WMO) defines an early warning system as a major element of disaster risk reduction. It is put in place to prevent loss of life and reduce the economic and material impacts of hazardous events, including disasters. It involves facilitating public awareness of risks, efficient dissemination of messages and warnings, ensuring a constant state of preparedness, and early action.

CABARET Project Country Coordinator and DLSU Behavioral Sciences Associate Professor Dr. Marlon Era recognizes that coastal communities in the Philippines need to be introduced to the multi-hazard early warning system: "A multi-hazard system recognizes threats not only from a singular natural phenomenon, such as a volcanic eruption, to likely related disasters, such as earthquakes, tsunamis, floods, and fires."

To ensure the continuity of this system even with a change in the leadership of the local government units (LGUs), CABARET works at establishing and institutionalizing it.

TAPPING HEIS

CABARET highlights the role of HEIs in guiding communities to resilience. Interdisciplinary experts from the academe and private sector are viewed as LGU partners in monitoring and implementing projects and ensuring their continuity. Such projects are directed at empowering individuals and organizations with skills, competencies,

and credentials; meeting the challenges and specific needs of wider economic and social environments; and facilitating the exchange of experience and practice. Especially for the latter, CABARET requires cooperation between HEIs in Asia and Europe.



INTERDISCIPLINARY EXPERTISE

An advantage of working with academic institutions is access to a wealth of expertise from multiple disciplines. In CABARET, an interdisciplinary team may include weather scientists, development experts, health specialists, and behavioral scientists, all working together.

This kind of collaboration ensures a smooth and effective flow of communication, so that upstream information (containing scientific data) is converted into palatable language for the communities; their indigenous knowledge, systems, and practices (IKSP) are taken into consideration.

"From a social science perspective," Era explains, "IKSP should be integrated in communications. How are you going to address the psychosocial issues that may arise from disasters? For example, in calamities, people will be affected emotionally, mentally, and physically. Social science will be important in terms of how you are going to resettle and relocate people. Relocation sites should be culturally and gender sensitive and should respond to the basic needs—not only for food, shelter, and clothing, but also livelihood and basic social infrastructure and lifelines should be available."

Era believes that there is very limited successful resettlement in the Philippines, because such needs are not given serious consideration. He said: "Part of our job is to influence natural scientists to consider IKSP, for us to be more effective communicators and become a more powerful influence, and because we also need to be more inclusive."

This need for inclusivity underscores the collaborative nature required in capacity building, which is at the heart of CABARET. It is a system built upon the commitment and sustained efforts of scientists who process natural data, researchers who process information, social scientists who advocate for policies, and communities and institutions that implement and manage it. A safer world is, indeed, every person's work.

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The latest CABARET workshop was held in March 2019 and hosted by the DLSU Social Development Research Center in Manila. It was part of a series of workshops held in Colombo, Santander, Kandy, and Yangon and focused on issues concerning education, advocacy, and knowledge development.

Aside from Dr. Marlon Era, DLSU representatives of the organizing delegation also included Dr. Mario de Leon of the Gokongwei College of Engineering, Dr. Edgar Vallar of the College of Science, Dr. Abdul Jhariel Osman of the Br. Andrew Gonzalez FSC College of Education, Dr. Maria Caridad Tarroja of the College of Liberal Arts, Connie Maraan of the Social Development Research Center and Mr. Leo Tadena of the Center for Social Concern and Action.

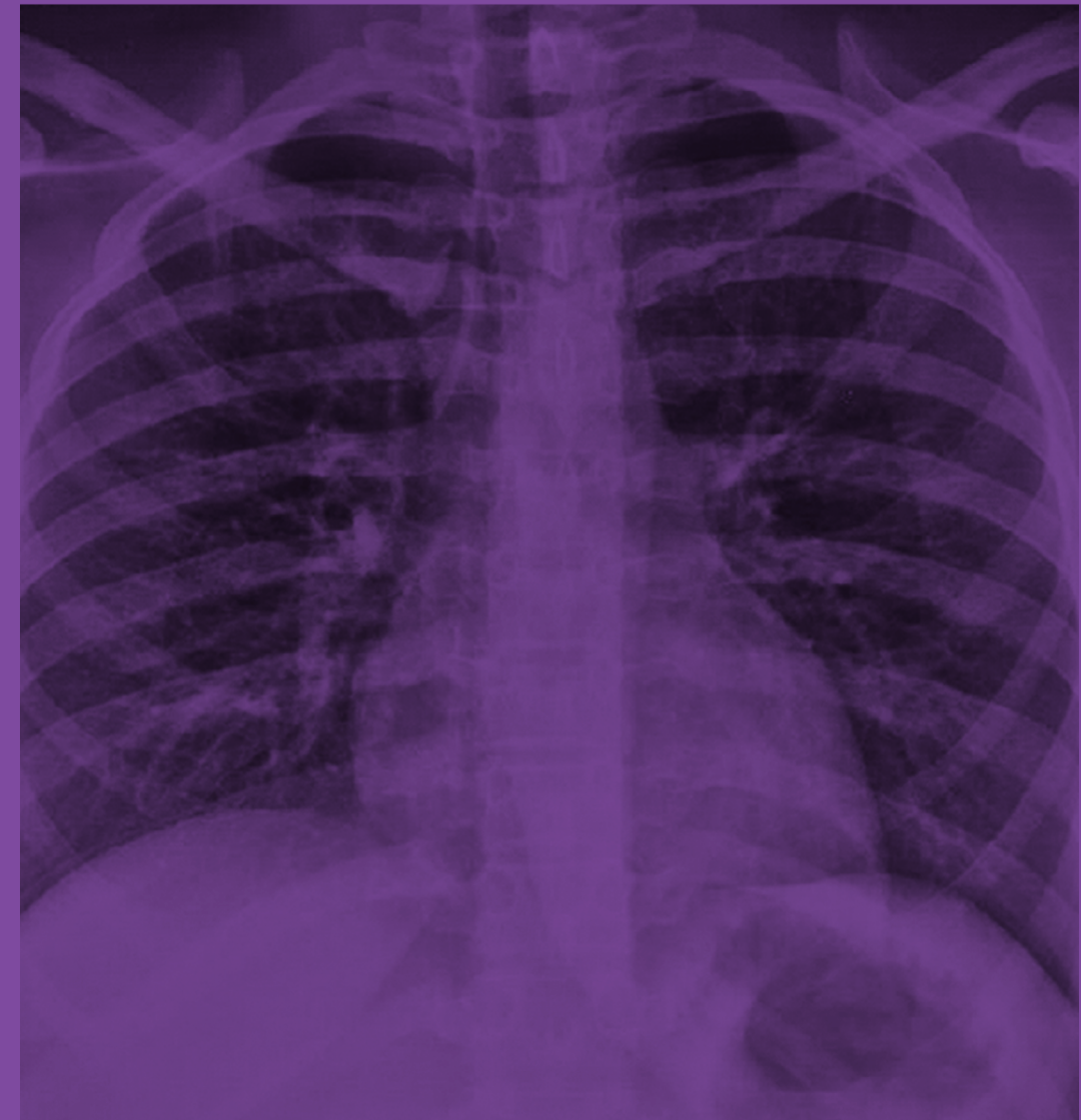


Dr. Marlon Era is Associate Professor of the Behavioral Sciences Department of DLSU and CABARET Project Country Coordinator.

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IS THIS THE ANSWER TO LUNG CANCER SCARE?

A Physics professor conducting research at DLSU Laguna Campus develops an affordable nano gas sensor device that can provide an accurate and immediate diagnosis of lung diseases such as TB and cancer.



World Health Organization data shows that in the Philippines, the number of new cancer cases in 2018 reached a total of 141,021. While breast cancer was the number one type affecting the female population, lung cancer was the most prevalent among the male population. For that year alone, 17,255 new cases of lung cancer were recorded.

The figures mirror the daunting task that the Philippine Lung Center needs to contend with. With a steady stream of patients coming in over the years while also facing fiscal limitations, the Center sought ways to aid indigent patients, beginning with the initial stage of cancer detection.



It was in this light that the iNANO research facility of the DLSU Laguna Campus embarked on the development of a nano gas sensor device.

Physics Department Professor Dr. Gil Nonato Santos, who concurrently serves as the Vice Chancellor for the Laguna Campus, shares that his ongoing research in collaboration with the Philippine Lung Center has support from USAID’s Science, Technology, Research, and Innovation for Development (STRIDE) Program and industry partner Integrated MicroElectronics, Inc.

“The nano gas sensor is intended to help poverty-stricken patients who cannot afford to pay for a series of laboratory services in detecting lung disease,” he points out.



RAPID DIAGNOSIS

Santos explains that the device is an economical alternative since it can identify the disease in a matter of minutes, helping the doctor provide an immediate and appropriate care to the patient.

Currently, patients have to go through a series of tests—x-ray, specimen testing, culturing of specimen, blood test, and biopsy—which is not only costly but also time-consuming. For many patients who cannot afford to go through all these, the tests may take weeks or months before they can get confirmation of their condition.

For the research, the iNano research team of Santos developed a nano crystal tested for aldehydes, a volatile organic compound (VOC) that is uniquely present in the breath of individuals with lung cancer patients. Also, the research developed a patented system for synthesizing nano materials called the Horizontal Vapor Phase Growth Technique and gas sensing using nano sensors.

Recently, the iNano research team developed an array of gas sensors tested by the Philippine Lung Center facility, for 30 patient-volunteers. The results showed a 90% accuracy, which meant a great boost for the research program but nonetheless a reminder to move further to achieve the goal of attaining the highest standards for the project. For the research team of Santos, that next step is making the research testing arbitrary to further the accuracy and improve the design of this nano gas sensor device.



Dr. Gil Nonato Santos is Professor of the DLSU Physics Department and Vice Chancellor for the Laguna Campus.

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WILL HOUSES OF THE **FUTURE** BE MADE OF **WASTE?**

Top faculty researcher Dr. Michael Angelo Promentilla leads a DLSU team that is developing geopolymers, an eco-friendly and inexpensive substitute to conventional cement. His vision can shape the future of the local construction industry and the way we protect the Earth.

If there is someone who could imagine the potential of industrial wastes from thermal power plants or rice hull ashes from farms across the country, then it would certainly be De La Salle University’s Chemical Engineering professor, Dr. Michael Angelo Promentilla.

Responding to the global call towards a “low-carbon circular economy and sustainability”, Promentilla embarked on the development of a construction material that would be an alternative to the conventional cement—the geopolymer.

“Geopolymer products like ‘green’ cement have the potential to significantly reduce our carbon footprint and energy consumption. It uses coal fly ash instead of the traditional limestone, which when manufactured emits carbon dioxide and consumes more energy,” he says. He adds that the traditional concrete produces as much as 80% more carbon footprint as compared to that of geopolymer.



Promentilla’s research on coal ash utilization and geopolymer technology, which he started in 2013 when he received a seed grant from the National Academy for Science and Technology, is a response to the environmental threats that come from the rapid growth of urban and industrial areas in the country.

“Every year, the country generates around three million metric tons of coal fly ash, or CFA, which is a by-product of thermal power plants,” he says, pointing out that the accumulation and improper disposal of CFA to vast land areas could result in soil degradation and risks

to human health and the environment.

At the same time, he shares that his research has led him to look into the agricultural sector, which produces a large amount of rice hull and waste abaca fibers—abundant, natural, raw materials often discarded but which he often thought could have a role in reinforcing the geopolymer matrix.

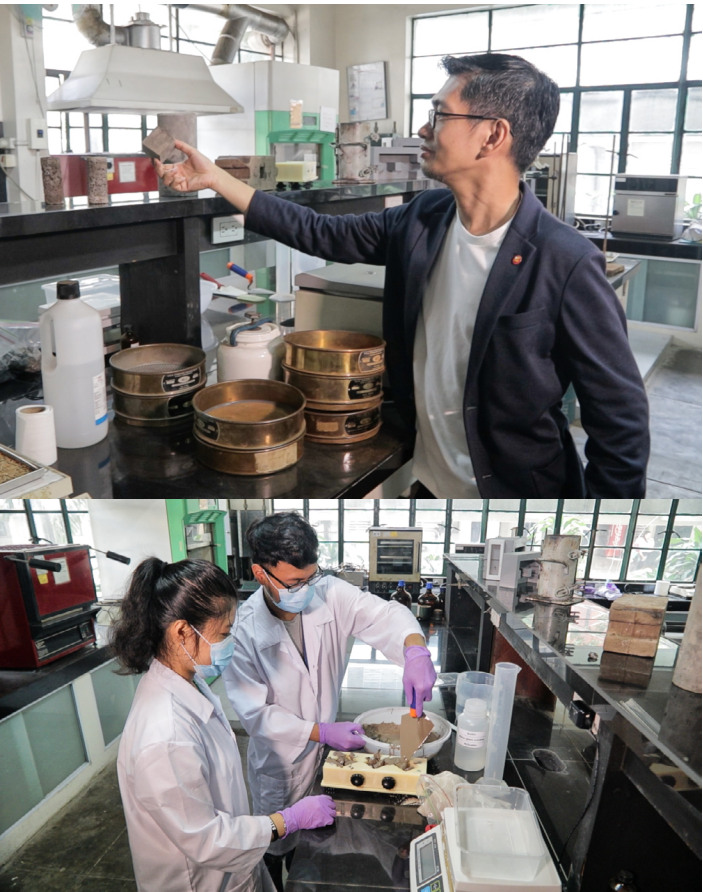
His research proposes that the raw materials and mix design of the geopolymer cement be environmentally sustainable and financially viable, as well as locally available.

HEAT AND ACID-PROOF PRODUCT

“By upcycling coal fly ash, we can produce ‘green’ materials or infrastructure materials with lower carbon footprint,” he says. He also reveals that the DLSU team he leads—the Geopolymers and Advanced Materials Engineering Research for Sustainability (G.A.M.E.R.S.) Lab—at DLSU is currently collaborating with Mindanao State University-Iligan Institute of Technology (MSU-IIT) and Central Mindanao University (CMU) researchers to study the possibility of using mining waste.

Their research currently explores three applications of geopolymer: one is a fire-resistant building material; another is an acid-resistant material; and the last, a geopolymer reinforced by chemically-treated waste abaca fiber.

“My vision is to commercialize the product and use the material, especially for government mass housing projects,” he shares. It may be realized in five or 10 years, he says. For now, the complex work continues for the G.A.M.E.R.S. Lab as the team seeks to make their geopolymer product fully viable for construction, and thus bring new life to the country’s wastes and ashes.



France-based Geopolymer Institute recognizes De La Salle University as the only university in the Philippines to do a comprehensive study on geopolymer science and technology. The multidisciplinary G.A.M.E.R.S. Lab at DLSU is working in partnership with Tokyo Institute of Technology, the Ho Chin Minh University of Technology, Mindanao State University-Iligan Institute of Technology (MSU-IIT) and Central Mindanao University (CMU).

POTENTIAL USES OF GEOPOLYMER-BASED PRODUCTS

- Geopolymer cement for construction, particularly for mass housing
- Soil stabilizer using a solidification technique to trap heavy metals
- Water treatment beads or composites to purify water

Dr. Michael Angelo Promentilla is a faculty member of the DLSU Chemical Engineering Department and ASEAN Science Diplomat from the Philippines. He has won various scientific awards from national and international bodies such as the National Academy of Science and Technology, Commission on Higher Education, National Research Council of the Philippines, and the Japan Concrete Institute.

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CAN WE KEEP THE **IVATAN** CULTURE **ALIVE?**

The Ivatan tradition of constructing vahay (house) and tataya (boat) is slowly disappearing. A faculty team from DLSU seeks to preserve it through the Batanes Documentation Project.





For years, the Ivatans, or the local folk residing on the islands of Batanes, have long held onto their custom of making the traditional *vahay* (house) and *tataya* (boat). But, with the advent of modern infrastructure development, availability of durable, cost-effective construction materials, and national laws prohibiting the use of certain natural resources, it is now slowly being forgotten.

To preserve these Ivatan traditions and ensure that they are not lost in history, the National Historical Commission of the Philippines (NHCP) tapped DLSU faculty, among a few others,

to document and record the last of these Ivatan houses and boats through a coffee table book, to create a manual on how to construct them, and to produce a video documentary that can be accessed online.

History Department faculty Dr. Lars Raymund Ubaldo and Vicente Angel Ybiernas, Department of Communication's Gary Mariano, Jimmy Domingo, Jake Ruiz, and Rica Arevalo all pitched in to complete the Batanes Documentation Project. The project was supported by the DLSU Social Development Research Center.

The Ivatans' *vahay* or house has two types: the older type, which is made mainly of light materials such as cogon, reed, and wood; and the other, which is more famously associated with the Ivatans, are the stone houses that are made up of piled stones mortared with a mixture of lime and sand. These houses are roofed with several layers of thatched cogon clipped together by reed or bamboo and fastened to the wooden roof frame by a local variety of rattan.

To date, only a thousand of these *vahays* are still standing on the islands of Batanes-some still being used and kept in good shape, while others are abandoned and with no sign of being restored.



On the other hand, the traditional *tataya* or boat is made up of several parts, namely the *managad*, *tavas*, *lagkaw*, among others, and these were chopped out of timber using stone and wooden tools such as adze and *tataho* (wooden mallet). *Tatayas* are made by Ivatan master boat builders, and while the kind, shape, and general features of the boat remain the same since hundreds of years ago, the process of making it and the materials used changed because of environmental constraints and technological advancements.



For thousands of years, the Ivatans have survived the harsh conditions of the Batanes islands because of the durability of the traditional *vahays* and *tatayas*. But today, their construction is now almost impossible.

FORBIDDEN TRADITION

In an interview, Mariano explains that the production of both the *vahay* and the *tataya* using traditional materials are now actually forbidden, with national laws in place that penalize the unauthorized cutting of timber and ban the extraction of lime from the sea.

When the team went to Batanes to collect data for the project, they initially thought that they were merely documenting what the Ivatans are still doing to this day. But they soon found out that the Ivatans are no longer making *vahays*

and *tatayas* the traditional way. The last *vahay* done using limestone was made back in the 1970s.

The team was able to talk with only one Ivatan master boat builder who knows how to create the *tataya* using traditional materials. "The memory of how to build these is soon fading. So the significance of NHCP's intervention is to document and posterize everything for the future," Mariano says.

Copies of the coffee table book and the construction manuals are now available

at NHCP, while the 30-minute documentaries are available for viewing online. More information about this project can be found on this website: <https://sites.google.com/dlsu.edu.ph/batanes>



Photos by: Jimmy Domingo

The DLSU team for the Batanes Documentation Project is composed of History Department faculty members Dr. Lars Raymund Ubaldo and Vicente Angel Ybiernas, and Department of Communication's Gary Mariano, Jimmy Domingo, Jake Ruiz, and Rica Arevalo. History Department Full Professor Dr. Rene Escalante, as the current chair of the National Historical Commission of the Philippines, initiated the project, and was supported by the director of the DLSU Social Development Research Center, Dr. Caridad Tarroja.

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Mariano



HOW CAN CHATBOTS HELP CHILDREN CREATE STORIES?

A team of DLSU faculty is developing a conversational agent or chatbot to engage children in storytelling.

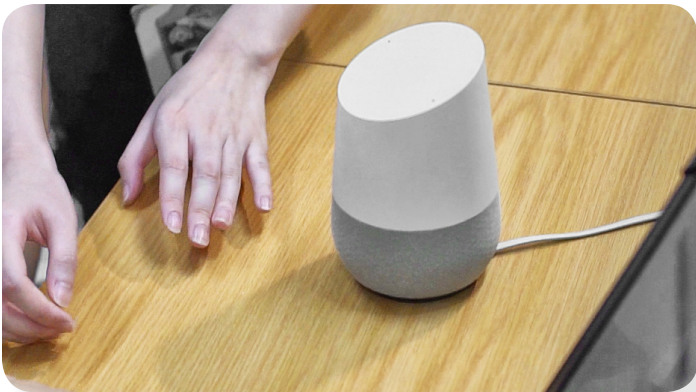
In recent years, conversational agents have become more popular as a human-computer interface, especially with the development and release of various commercialized agents like Siri, Google Assistant, and Alexa. These agents are integrated into mobile systems, intelligent devices, and even personal computers.

Currently, the main function of chatbots is to perform tasks as an assistant to their users through simple command-and-follow instructions.

Software Technology Department Assistant Professor Ethel Ong saw this as an opportunity to explore the ability of conversational agents to provide support in the context of collaborative storytelling where they must be able to conceptualize ideas and generate appropriately related responses.

Her team developed a virtual collaborative storytelling agent dubbed as ORSEN that aims to leverage artificial intelligence (AI) with conversational interfaces to provide humans with more convenient ways to interact with AI systems.

ORSEN is a chatbot that can be deployed through both Google Assistant or Google Home as a voice-based chatbot as well as through Firebase as a text-based chatbot.



By exchanging story segments through a continuous dialogue, ORSEN and the child can create a story collaboratively. To do this, the team designed ORSEN to take on the roles of facilitator and collaborator.

The team has also identified and equipped the software with five collaborative dialogue strategies that encourage children to expound on their stories through a two-way conversation. ORSEN can prompt the children to narrate new events, describe various story elements like characters and settings, ask

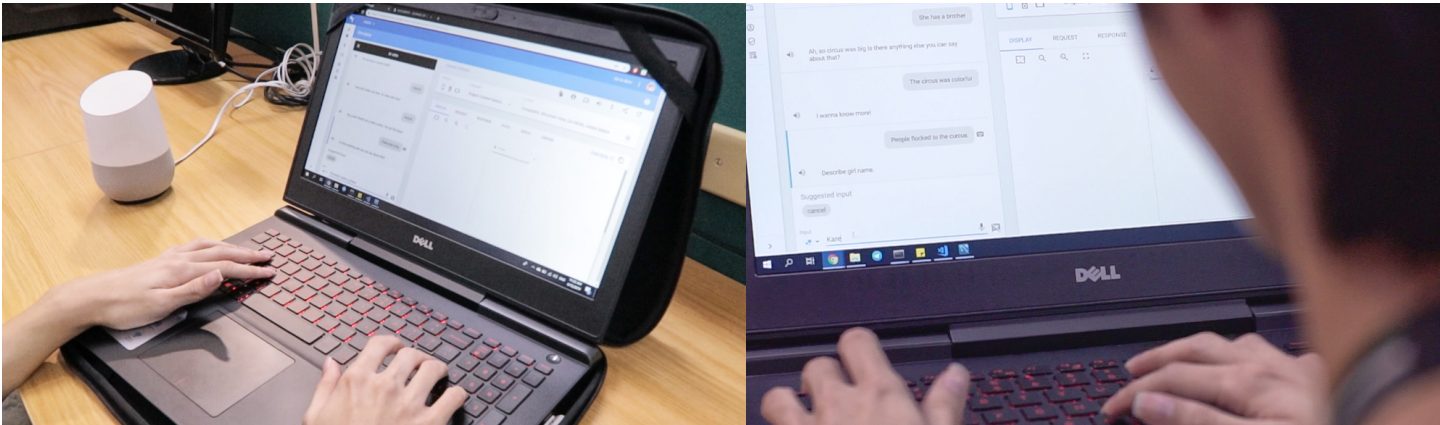
for specific details like color or size of the object, and even add its own story text.

The software is also designed to respond to specific commands that can trigger certain dialogue strategies when a child user asks for help in moving forward with the story. After a storytelling session, a user may choose to listen to ORSEN retell their created story that is reconstructed from the event chain.

Ong shares that there are various applications of the chatbot in the education sector, specifically

to engage their human users in natural conversations by understanding sequences of text as a form of story and events about the latter's life.

On concerns that chatbots might contribute to further increase in mobile use among children, Ong underscores that the technology would actually complement learning and interaction with parents and teachers. By constantly improving the software, they hope to help boost the creativity and learning of children.



Ong's team is also looking into applying the software in other fields such as healthcare systems to understand users' daily activities and behavior that impact their health practices, as well as business process outsourcing customer support to elicit details from human callers who report events surrounding their problems and concerns. The chatbot can also enrich the delivery of instructional materials in interactive narrative-based learning environments such as sharing information on museum artifacts or making science experiments and history lessons more relevant through sharing of daily experiences with learners.

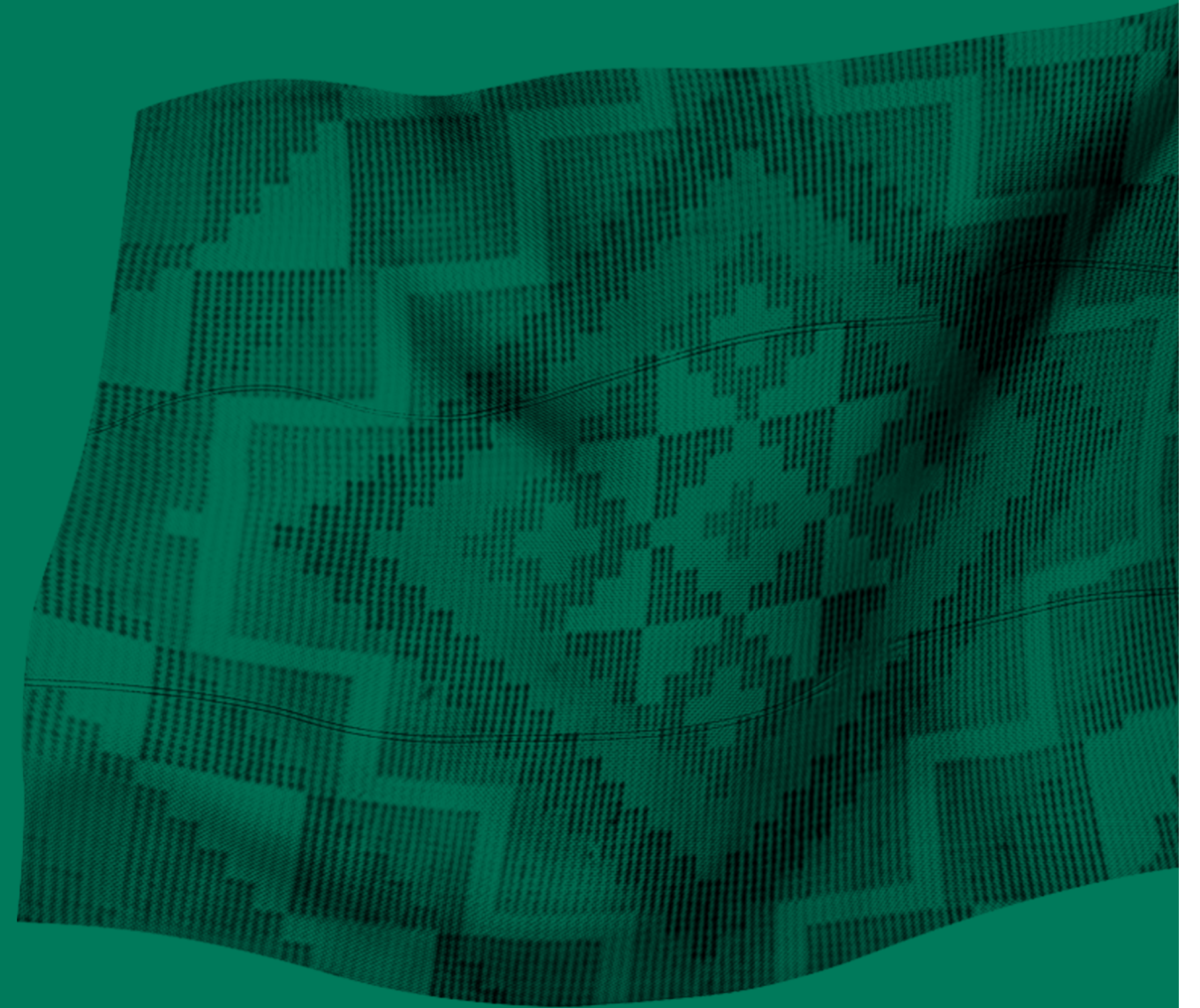
Ms. Ethel Ong is an assistant professor of DLSU Software Technology Department and senior researcher of the Center for Language Technologies of the College of Computer Studies – Advanced Research Institute for Informatics, Computing, and Networking (AdRIC). She is working with Dr. Ma. Joahna Mante-Estacio, an associate professor of the Department of English and Applied Linguistics; Mr. Genaro Gojo Cruz, assistant professorial lecturer of the Department of Literature; and Ms. Jennifer Ureta, assistant professor of the Software Technology Department.

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WHAT IS OUR LEGACY TOWARDS MINDANAO PEACE?

A team of researchers from De La Salle University evaluates the government's peace-building initiative called "Payapa at Masaganang Pamayanan" (PAMANA), which aims to lead conflict-stricken areas in Mindanao on the road to recovery and development.



Mindanao’s history has been laden with stories of poverty and armed conflict since the 16th century. Today, many parts of the region are still affected by the same struggles. Despite being the prime source of crops for exports such as banana and pineapple, conflict areas in Mindanao remain impoverished and make up ten percent of the Philippines’ overall territory. The poorest region is in Mindanao and four out of the five provinces with the highest poverty incidence are also found in Mindanao.

Conflict and economy are closely linked: the fight for resources and control over them are the root of organized violence. Institutional fragility also creates the risk of violent conflict. For this reason, Mindanao’s economic growth is always stunted, affecting the residents’ quality of life. This lack of control leads to issues such as little or no access to safe roads, potable water, quality health services, employment opportunities, and education.

To help address these problems, the government through the Office of the Presidential Adviser on the Peace Process (OPAPP) launched in 2009 an initiative dubbed as PAMANA or *Payapa at Masaganang Pamayanan*.



PAMANA aims to establish lasting peace through spearheading policy reforms in the national level, overseeing the efficient delivery of goods and services focused on homes and communities, and linking conflict-affected areas to marketplaces and livelihood opportunities.

The initiative involves the collaboration of local units and national institutions and making them transparent and accountable for various projects. These include sustainable rural development projects, local infrastructure, and social development. PAMANA also seeks to empower communities by strengthening their capacity to address issues of conflict and peace through activities that foster social cohesion and well-being.

To evaluate the project six years after its establishment, a team of faculty researchers from De La Salle University was commissioned by OPAPP to review and evaluate the PAMANA Program, which covered the period from 2009 to 2015. It covers 5 PAMANA zones composed of 32 provinces located in Luzon, Visayas, and Mindanao. One of the outputs of this project is a research paper entitled, “An evaluation of the impact of peace-building initiatives on socio-economic conditions in conflict affected areas in Mindanao,” which covers 3 PAMANA zones of 23 provinces in Mindanao.

Working on the research were School of Economics (SOE) Dean Dr. Marites Tiongco, who led the team, and fellow DLSU faculty members Dr. Reynaldo

Bautista, Jr., Dr. Maria Ella Oplas, and Dr. Francisco Magno.

Their research work was able to link how peace building efforts spurred a level of socioeconomic growth in the selected areas in Mindanao. Based on their findings, the PAMANA initiative reduced poverty through the creation of jobs, easier access to health clinics, construction of roads, and community-driven development projects.



The study showed a reduction in poverty incidence by 1.79 percent, which is the average effect of PAMANA on the barangays experiencing conflict. For the residents of beneficiary communities, the availability of employment and other sources of income and all the benefits they entail served as deterrents for joining or sympathizing with insurgents.

However, while PAMANA was successful to some degree, implementers and host communities experienced setbacks. Because residents would throw their support behind the government, insurgent groups would sabotage the peace-promoting projects in order to prevent shifts to supporting the institution. This, in turn, slowed down the pace of socioeconomic growth and development in these areas.

Apart from continuing the PAMANA initiative, the researchers also recommend establishing a mechanism within the government that would glean more data from conflict-affected areas in order to better assess the impact of the program. Enhancement of the program is another recommendation: it could be improved further to complement the peace and development efforts of the government in addressing issues of injustice and improving access to socioeconomic interventions by capacitating the local government to adopt conflict-sensitive and peace-promoting (CSPP), culture-sensitive, and gender-sensitive approach to human rights promotion and development.

Establishing peace and stability in a place that has a long history of armed conflict is a monumental undertaking that may take years and years of work. But initiatives that provide livelihood, basic services, and better infrastructure are gradually making a difference. By encouraging Mindanaoans with programs like PAMANA, they can focus on maintaining their income sources, strengthening their communities, and nurturing a healthier way of life.



Dr. Francisco Magno, former director of Jesse Robredo Institute of Governance and faculty member of the Political Science Department, served as the project leader of the PAMANA Review. Dr. Marites Tiongco, faculty member and dean of the School of Economics (SOE), served as lead for the impact evaluation of PAMANA. Team members included Dr. Maria Ella Oplas, faculty member of SOE and Dr. Reynaldo Bautista, Jr., associate professor of the Marketing and Advertising Department.

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WHAT'S BREWING IN THE COFFEE SECTOR?

DLSU is fast becoming the coffee science hub in the Philippines through the various engagements of a coffee research expert from its Chemistry Department.



A self-confessed avid coffee drinker, Chemistry Department faculty member Dr. Emmanuel Garcia is putting his passion to action. Since his initial research on civet coffee almost four years ago, he has become an active participant in the industry by sharing his expertise on the different points of the coffee value chain.

In his latest research project, he led a team of researchers to investigate the effects of different pressures in the particle size distribution of espresso obtained from four different coffee blends by means of laser diffraction analysis. The particle size distribution is the variety of particle sizes in a sample.

Garcia says that, theoretically, more compounds can be extracted from finer particles that contribute to the flavor profile of the coffee. Their study shows that varying blends have characteristic differences in the particle size distribution, which might have contributed to the reason behind the unique flavor profile of the espresso shots. Extracting in different pressures also brought perceived changes in the flavor attributes of the espresso. This study also gives additional insights into the fluid dynamics during extraction, something that may allow coffee professionals control sweetness, acidity, bitterness, and body of the final cup.



This research is part of his continuing collaborative projects with different stakeholders of the Philippine coffee industry who identify real and concrete gaps in the industry.

Underscoring the importance of scientific research, Garcia notes how it cuts across the whole value chain of coffee. Through a deeper understanding of each part of the coffee value chain and its interdependence, coffee quality and volume of production can be improved to ultimately benefit the coffee farmers, who are the marginalized players in this industry.

His sentiment echoes the Department of Trade and Industry (DTI) 2017 Policy Brief on Philippine coffee, and its place in the coffee global value chain (GVC). It states that upgrading the country's capabilities in the coffee GVC requires a broad development strategy that requires the engagement and involvement of a wide range of stakeholders.

In the DTI development plan, the research component plays an integral part from improved data collection and expanded dissemination of robust research agenda to an independent assessment of coffee production, tree ages, soil and leaf analyses, and agronomic techniques being used in coffee growing regions.

As part of DLSU's continuing efforts to contribute to the local industry, Garcia is leading the establishment of a DLSU coffee laboratory that would contribute to more awareness and encourage more multidisciplinary research and collaborations. The lab is envisioned to strengthen the collaborations between DLSU and stakeholders of the local coffee industry.



Since April 2017, he has initiated regular coffee meet-ups, where participants tackle various coffee concerns, from food safety to climate change and other threats to coffee production. He shares that there is now noticeably more participants in this free activity. Initiatives like this have influenced a group of coffee farmers from Batangas, who now appreciates the role of science and seeks his expertise to help them in improving the quality and production of coffee in their area. He is also working with a local government unit and a non-profit organization

in Quezon, as well as a small college in the Cordillera region, which he is helping to establish a coffee research center.

"La Salle is the only academic institution that has presence in practically all coffee-producing countries," he notes, adding: "If La Salle schools in South America, Africa, and East Asia could pull together their strengths and capabilities, we can actually produce research projects that can have a huge impact on the global coffee industry."

Dr. Emmanuel Garcia is a faculty member of DLSU Chemistry Department and director of the Food and Water Institute. He is the first Filipino fellow in the Re:co Symposium, an annual event organized by the Specialty Coffee Association, the world's premier association and authority in coffee.

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DLSU LAGUNA CAMPUS

ADVANCING SCIENTIFIC AND TECHNOLOGICAL RESEARCH

De La Salle University has a growing number of scientific experiments and technological work that are conducted on its campus in Laguna, located southeast of Metro Manila. The 51-hectare campus is envisioned to become a leading resource for S&T advancements in the country and in Asia-Pacific, with the establishment of modern facilities for multidisciplinary and collaborative research.

DR. GEORGE S.K. TY ADVANCED INSTRUMENTATION BUILDING

The **Dr. George S.K. Ty Advanced Instrumentation Building** is a multidisciplinary facility that offers high precision equipment for experiments and lab works.

One of the major features of this facility is the state-of-the-art Nuclear Magnetic Resonance Spectrometer Lab, where molecular and compound structures are studied. With its capacity to reach a higher frequency compared to that of similar devices in other universities in the country, it is expected to produce results in a lesser amount of time.



RICHARD L. LEE ENGINEERING AND TECHNOLOGY BLOCK

The **Richard L. Lee Engineering and Technology Block** is the hub for DLSU's engineering courses and currently houses the different industry locators doing various R&D projects on campus.



JOHN GOKONGWEI, JR. INNOVATION CENTER

This facility currently houses the Philippine hub of international gaming giant, Ubisoft. The gaming company is a leading creator, publisher, and distributor of interactive entertainment and services.



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