

June 2025 Issue #13 DE LA SALLE UNIVERSITY INNOVATION • SUSTAINABILITY • IMPACT OCCUPENTIONS



University Charter Golden Jubilee

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# KNOW. ACT. CHANGE.

# WE ASK TO

This issue of QUESTIONS focuses on De La Salle University's research projects and initiatives that contribute to the development of a green knowledge ecosystem.

We explore the potentials of technologies for peace, progress, and sustainability. We seek to understand challenges in systems and structures. We help build the foundations for national policymaking to ultimately bring a positive impact on the lives of our people and the planet.

# QUESTIONS

**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."

# QUESTIONS

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# Where will the Philippine economy be in 2050?

A faculty team from the DLSU Carlos L. Tiu School of Economics analyzed the Philippine economy and forecasted how it would change between now and 2050, in a project titled, "The Philippines 2050: Wishes and Reality."

# Where will the Philippine economy be in 2050?

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m W}$ e all wish that by 2050 the Philippines could be a high-income economy. This would be just a little over a century since our nation attained independence. Being a high-income economy would imply that our workers would earn much higher wages because few of them would work in agriculture, and, instead, most would be employed in industry and services. It would also mean much lower poverty rates. Perhaps we would be able to generate advanced technologies," says Dr. Jesus Felipe, DLSU Distinguished Professor of Economics.

At present, however, the country is far from that goal. "Many of the countries in the region, countries that were poorer than we were not long ago, including Thailand, China, Indonesia, and Vietnam, have overtaken us," he adds. Currently, the Philippine income per capita is still low at \$4,300, placing the country in the lower middle-income segment.

Dr. Felipe leads a team of faculty from the Carlos L. Tiu School of Economics working on a project called "The Philippines 2050: Wishes and Reality." To start, they took stock of the present condition and then analyzed how far the Philippine economy could realistically go during the next 25 years until 2050.

One of the economic components that the researchers looked into was the labor force. They found that most Filipino workers were employed in sectors of very low productivity, leading to equally low wages. "Twentyfive percent of our workers—approximately 10 million employees—work in agriculture. Over 20% is employed by wholesale and retail trade and about 9% in construction," shares Dr. Felipe.



The researchers noted that employment in manufacturing accounted for about 8% of total employment and that Philippine companies were not big exporters that compete in the international economy. They further noted that local manufacturing firms had low organizational capabilities. "This explains the situation that we have today, why our income per capita is low, the productivity low, and why most of our workers are still employed in agriculture and other services of very low productivity," Dr. Felipe points out.

They argued that the country's economic policy should focus on "increasing productivity, manufacturing, exporting, and the understanding that firms are at the center of all this."



## ANIMO macroeconomic model

To understand the economy and generate forecasts of variables such as growth, poverty, income per capit and the structure of the economy, Dr. Felipe and his team developed the ANIMO Macroeconomic Model of the Philippine Economy.

In their analysis, the researchers expressed optimism that the economy would experience positive changes: poverty would go down, workers in the agricultural The government also plays a pivotal role in the development of the country. First, it needs to sector would decrease, and the structure of the economy would not be the same as that today, all appropriately provide all the fundamental goods this resulting in an increase in wages and income per that our society needs, such as education, infrastructure, and health. Second, the government capita. also needs to coordinate the affairs of the private sector. "The government is the only agent that can coordinate the activities of hundreds, thousands today, we will not be a high-income nation unless our of firms for the common good."

"We are cautiously optimistic. However, we need to understand how far we can advance; 25 years from economic policy changes drastically and focuses on

productivity," says Dr. Felipe. The research team's output will be a book to be released in 2026. They believe that the publication "In high-income economies, no more than 5% of the will serve as a useful resource for students, academia, journalists, government, and professionals. "We hope workers are employed by agriculture, but they are much more productive than our workers in the sector because that it contributes to the changing economic policy they work with advanced technologies and methods. in the Philippines," ends Felipe. This share is declining in the Philippines but slowly.

ta,	The problem we face is that the sectors that create employment are not high-wage sectors; many of them are salespeople, or delivery workers," he continues.

"If we aspire to be a better nation with a higher income per capita and be more productive, there is a need to create jobs that pay higher wages," he points out.

# What does it take to localize women and child-centered policies?

De La Salle University (DLSU), the Iloilo State University of Fisheries, Science and Technology (ISUFST), and the Iloilo province LGU have partnered to localize policies for inclusive, sustainable development.



# What does it take to localize women and childcentered policies?

In many communities across the Philippines, national laws designed to protect women and children often fail to reach those they are meant to serve. Whether it is the Anti-Violence Against Women and Children Act, the Safe Spaces Act, or the First 1000 Days Law, implementation tends to weaken at the local level, diluted by coordination issues, lack of capacity, and minimal community engagement.

But in the province of Iloilo, a pioneering initiative is reshaping that dynamic.

A team led by the Jesse M. Robredo Institute of Governance (JRIG) of De La Salle University (DLSU), in partnership with the Iloilo State University of Fisheries, Science and Technology (ISUFST) and the Provincial Government of Iloilo, started a three-year project on the Localization of Women's and Children's Policies. With backing from the Senate Committee on Women. Children, Family Relations, and Gender Equality, the project aims to turn policy into practice through local ownership, data-driven planning, and institutional sustainability.





### Governance on the ground

For Dr. Francisco Magno, JRIG director and lead researcher, this localization is not simply a development buzzword but rather a governance imperative. "Local governments are on the frontline of service delivery, but they face a range of constraints, from budget to technical capacity," Magno shares. "So, we designed this project to help them bridge national mandates with local realities."

The approach builds on the SDG City model and evolves it into an "SDG Province" governance framework. Iloilo is the pilot site for this model, chosen for its proactive provincial leadership and ISUFST's potential to become a knowledge hub for policy and governance.

Central to the project is the creation of a policy center at ISUFST, where research, policy development, and capacity-building are anchored. Magno emphasizes that ISUFST is positioned as a long-term leader in evidencebased local governance and not merely a partner in the implementation of the said project.

Equally crucial is the groundwork done through focus group discussions and community consultations. These sessions unearthed key challenges: weak referral mechanisms in anti-VAWC implementation, poor inter-agency coordination, and the limited involvement of grassroots women's and children's groups in decisionmaking. "The key challenge in localization is the establishment of effective mechanisms...it's important to pursue both a whole-of-government approach and a whole-of-society approach."



### Encompassing effort

The project does not just aim to localize—it seeks Magno emphasizes that the ambition does not end to localize well, that is, anchoring decisions on with the province of Iloilo. As the project develops toolkits disaggregated, timely, and actionable data. Across many and documentation, the team envisions replication local government units, outdated or generalized statistics across other provinces and SUCs (state universities make it hard to see where women and children are and colleges), enabling localized governance to flourish underserved. nationwide.

Magno reiterates the need to establish a gender and The support from the Senate Committee on Women development office in the local government unit to ensure and Children, chaired by Senator Risa Hontiveros, further that the concerns of women are really integrated into signals a growing national interest in the approach. With universities like ISUFST taking the lead and LGUs the planning and budgeting process rather than being actively engaging, the model holds the potential to change tokenized in discussions. how public policy is designed, delivered, and sustained in the Philippines.

Through the project, LGUs are learning how to generate their own localized indicators, monitor outcomes, and align budgets with inclusive priorities.

From the data gathered from gender and development office and discussions, the project is shaping more strategic, gender- and child-responsive planning tools, enabling LGUs to track progress in a way that is both measurable and meaningful.

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"We talk about leaving no one behind." For Magno, this goal cannot be achieved without embedding inclusion in the systems, empowering communities, and making data work for people, not just programs.



# What's a more sustainable way to combat cacao pests?

A team of De La Salle University researchers led by Dr. Jose Isagani Janairo of the Department of Biology is exploring a machine learning-driven solution to counter a certain type of insect pest that threatens the production of Philippine cacao industry.

# What's a more sustainable way to combat cacao pests?



The Philippines has all the natural gifts for cacao production: good climate, favorable soil, and strategic location. For all its potential to be a major player in the multi-billion dollar cocoa-chocolate industry, however, the country is still pulling itself up from the great impact of pest infestation that almost wiped out the local cacao industry back in the '90s.

Data from the Department of Science and Technology (DOST) show a continuing decline in the volume of cacao production in the country in the past three decades, except for a short uptick from 2017 to 2019. Local farmers would record their lowest production yet in 2023 with only 1,092.27 metric tons of cacao, which was even lower than those of the pandemic years.

To help boost the sector, a team of researchers from De La Salle University (DLSU) embarked on a DOSTfunded research to combat the cacao mirid bug (Helopeltis bakeri), one of the major insect pests in the country and in other parts of Southeast Asia.

Dr. Jose Isagani Janairo, full professor at the DLSU Department of Biology and the country's project lead, shares that their team seeks to integrate machine learning in the discovery of semiochemicals of the cacao mirid bug. "Semiochemicals are chemical signals used by plants and insects to communicate and navigate their surroundings," he says.

"The exciting part of our study is we're eavesdropping on plants and insects. By trying to understand the language of chemistry used by these plants and insects, we can send out fake signals that we can use to fool the pest," he adds.

## From synthetic pesticides to a more sustainable approach

The cacao mirid bug is an insect with a very long proboscis, which is used to puncture the cacao pods. "Once the pods have been punctured, they serve as a gateway for other pathogens to enter, and this leads to accelerated pod rotting," Janairo says. "We cannot use them for anything else. And so this has been our motivation to develop sustainable pest management approaches to the cacao mirid bug."

Since 2016, Janairo and his research group at the Institute of Biological Control at the DLSU Laguna Campus have been involved in the development of sustainable approaches to cacao pest management. Exploring the field of semiochemistry, they have focused on one of its applications, which is semiochemicalbaited traps.

The research involves the identification of a possible compound to which the cacao mirid bug is attracted. A compound acts like a signal that tells the bug there is food to feed on, and it is exclusive to certain bugs



### A boost to the farming industry

The research team is composed of experts from various disciplines, among them entomologists, chemists, and agriculturists, all actively collaborating to develop sustainable pest management approaches, not only for cacao but for other crops as well.

For their latest project, they are building on years of previous efforts that had been undertaken with support from the DOST Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development. Among their major work was the discovery of a compound called beta-caryophyllene as a behaviorally active semiochemical.

"The challenge for us right now is to develop something more potent," Janairo says. With the integration of machine learning, the team could

or insects. Once the compound is identified, it can then be placed in a trap.

Janairo points out that since chemical signals are very specific, no other insects, animals, or plants will respond to the trap. The project offers a sustainable alternative to common pest management methods, such as using plastic or synthetic pesticides that harm not only other species but the environment as well.

For their predictive model, the research team is building a dataset of candidate compounds from which they will identify the specific compound that will elicit a physiological response to the pest. The team will study, for instance, if the mirid bug responds to a compound that is more hydrophobic.

Because of the tedious work of semiochemical discovery, which involves a lot of trial and error and demands a lot of resources, the machine learning model will come quite handy, Janairo says.



now screen thousands of compounds in a much shorter period of time. Beyond the identification of potent compounds, they express hope for the fulfillment of their ultimate goal: "We want to use science to benefit not only the farmers, but the Filipino people in general."

# How can we prepare for AI in corporate governance?

The expanding presence of artificial intelligence (AI) in modern society has permeated nearly every facet of human existence including the corporate landscape. Examining the legal challenges of this new reality, a faculty member from De La Salle University's Department of Commercial Law pushes for the creation of a general legal framework for AI in Corporate Governance.

# How can we prepare for AI in corporate governance?



 $\mathbf{I}$  he earliest concept of artificial intelligence (AI) came from the groundwork laid by the famous British scientist Alan Turing during the mid-20th century, which was the development of an "algorithm" that would ultimately pave the way for modern-day computers. Today, Turing's research and philosophy serve as the foundation of modern-day artificial intelligence.

"In our world right now, artificial intelligence has crept into a lot of the many aspects of our daily lives, one of which is its integration in the corporate setting," says De La Salle University faculty member Atty. James Keith Heffron from the Department of Commercial Law. His curiosity about robots and AI has led him to pursue research about AI's role in Philippine Corporate Governance.

In a paper he wrote, he noted that the efficacy of AI functioning within a corporate framework was first observed back in 2014, when a Hong Kong venture capitalist firm on the brink of bankcruptcy commissioned a team of big data analysts to help assist the board of directors in solving its management issues. The team created an artificial intelligence system called VITAL (Validating Investment Tool for Advancing Life Sciences), which eventually proved to be so successful that it was

made a part of the management team and appointed as a director on "observer status."

Citing the success of VITAL, Heffron notes the many advantages of artificial intelligence for other corporate entities to adopt it. "The advantage of using AI really is all about performance, consistent quality, and productivity. Its decisions are also based on pure scientific methods that are devoid of any emotional bias and fallacious logic, which means there is less potential for human error and a higher cost-benefit ratio of efficiency."

Despite these fascinating conveniences with artificial intelligence, however, Heffron also points out a number of disadvantages with its use for decision-making. "The main benefit of artificial intelligence is that its decisions are free from any biased human emotion, but there are some decisions that demand the need for human empathy and moral compass that it cannot provide." He also indicates the susceptible nature of AI to negative outside influence, such as data breaches and hacking. "At the end of the day, a robot is still a machinea machine created by humans and therefore not immune from malicious tampering."





Heffron proposes that there must be at least one human director who is well-versed about the AI system and tasked to explain its various processes and functions to all stakeholders, who in turn should also practice their own due diligence and research before affirming any decisions made using the AI system. Failing to do this duty, any harmful decision executed by the AI system shall hold the director and the approving stakeholders accountable.

He adds that the framework does not particularly apply only to corporate governance. "The framework should be applicable to all. If you analyze it further, the basic principle or value here really is integrity and security or accountability, so it essentially is universal."

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### **Encompassing effort**

Heffron also raises a basic concern on liability issues that a company may encounter with the use of artificial intelligence, which does not have any legal personality. In the case of management decisions that result in damages, losses, or even injuries to stakeholders, who, then, should be made liable?

In his paper, Heffron references Israeli Professor of Criminal Law Gabriel Hallevy on traditional forms of criminal punishment vis-a-vis artificial intelligence. "The positivist theory under criminal law dictates essentially that punishment should be rehabilitativethe idea is to correct the behavior of an erring individual until he is taken back by society again. The thing about robots or artificial intelligence is that you cannot have some kind of punishment that could rehabilitate it. Because how can you punish somebody who's not self-aware?"

In response to the revolutionary impact of artificial intelligence on the corporate world, Heffron proposes a theoretical framework that is based on the "ASEAN Guide on AI Governance and Ethics," a living document that provides a set of guidelines for governments and businesses in the use of artificial intelligence. The guidelines offer seven key principles, which are transparency and explainability, fairness and equity, security and safety, robustness and reliability, human centricity, privacy and data governance, and lastly, accountability and integrity.

Envisioning what lies ahead, Heffron expresses optimism as he refers to the law of accelerating returns and the exponential development of

technology: "One hundred years ago, we really didn't have any computers yet, but now we have already created machines that can learn for themselves and decide on their own. I also hope that other articles such as mine, could help contribute to that ongoing conversation, so that our policymakers could eventually develop a good legal and ethical framework to address this emerging technology."

# How can more Filipinos access free healthcare?

A team of researchers from the DLSU Social Development Research Center conducted a process evaluation of the government's PhilHealth Konsulta Package, which seeks to improve the country's primary healthcare access.



# How can more Filipinos access free healthcare?

To reinforce its commitment to providing universal healthcare access for every Filipino, PhilHealth, the national agency that provides health insurance coverage for Filipino citizens, introduced a program called PhilHealth Konsulta Package (Konsultasyong Sulit at Tama). This Konsulta Package is mandated under the Universal Health Care Act (RA 11223). In 2024, the agency announced the enhancement of this health package to further push for preventive care, early disease detection, and financial protection.

To assess the implementation of the program, an evaluation was conducted by a team of researchers from the De La Salle University (DLSU) Social Development Research Center. This evaluation was commissioned by National Economic and Development Authority (NEDA) and funded by the United Nations Development Program (UNDP) as part of the NEDA UNDP Strategic Monitoring and Evaluation Project. The investigating team, with Dr. Marites Tiongco of the DLSU Carlos L. Tiu School of Economics as team lead, along with Co-investigators Dr. Albert Lamberte and Dr. Zaldy Collado, Evaluators Dr. Pilar "Lalay" Jimenez, Dr. Jeriel de Silos, and Mr. Bernardo Cielo II, and Project Manager Joanna Cayton, conducted a comprehensive process evaluation of the program.

Tiongco shares that the team assessed the PhilHealth Konsula Package rollout, operational challenges, efficiency of accreditation, and financial sustainability. This assessment, covering accredited and non-accredited healthcare facilities across Luzon, the Visayas, and Mindanao, aimed to provide vital new perspectives on the operational effectiveness of the Konsulta Package within healthcare facilities.

The team was given six months to complete the process evaluation, which is part of the review of the 2028 Philippine Development Plan that includes the national health program.



"Basically, the PhilHealth Konsulta Package is really for preventive care. What we want is, at the very onset, we are given that protection already. We don't want the disease or the illness of an individual to become catastrophic, so we want them to get that primary care," Tiongco says.

She shares that under the program, every Filipino is entitled to be a Philhealth Member and avail of Philhealth Services. Every registered member is entitled to up to Php 1,700 annually in Konsulta benefits. This can cover consultation, diagnostics, and selected medicines through accredited public or private providers. In their fieldwork, however, the team discovered that not many were aware of this benefit, not just among the ordinary citizens but also among those working for the local government units.

"When people inquire about healthcare services, they are often surprised upon learning that the Konsulta Package is free," she notes. She adds that this showed a significant gap between public information and awareness, with patients no longer returning for crucial follow-up diagnoses and treatments because they lack the necessary information during the initial healthcare encounters. Likewise, the process evaluation team found that accredited healthcare centers also have to contend with their own challenges. According to Tiongco, there were persistent concerns related to the availability of needed equipment and facilities, as well as the hiring and training of staff and healthcare professionals.

The team looked into how the LGUs had been implementing the program vis-a-vis their mandate to assist in registering all their constituents with a primary care provider. The team also examined how these LGUs were allocating their human and financial resources.

"Konsulta Package aims to empower every Filipino. We thus encourage individuals to proactively manage their health. Enrollment is made available through self-registration or through one's chosen primary care provider," she points out. "By maximizing the Konsulta Package, we are getting closer to achieving the universal healthcare that we long for."

# The Konsulta Package provides the following range of services:

- Primary Care Services: Regular check-ups (initial and follow-up consultations), individual health screening and assessment, and case management
- Preventive Health Services: Early detection of health issues
- Medications: Availability of select drugs and medicines
- Laboratory and Diagnostic Examinations: About 20 types of basic lab tests available.



# What can boost hog raising in the country?

De La Salle University researchers are developing a vaccine against the African swine fever (ASF) virus—the biggest animal disease outbreak the world has ever seen in modern times—at their new laboratory on the DLSU Laguna Campus. Their project seeks to combat the continued spread of the virus and thereby contribute to easing the socioeconomic burdens it has brought on Filipino farmers and feed producers nationwide.



# What can boost hog raising in the country?



In 2019, before the outbreak of the COVID-19 pandemic, Filipino farmers were battling a virus that had threatened the country's food supply and security. Called the African swine fever (ASF), it developed rapidly and affected a large part of the swine population. Since then, it has affected not only the pigs from both backyard and commercial farms but also the wild pig population.

About 5 million pigs were culled, which resulted in approximately Php200 billion in losses by the end of 2024, according to the Pork Producers of the Philippines. For its part, the Bureau of Animal Industry recorded that 76 of 82 provinces have been affected as of April 11, 2025.

And yet to date, the world still awaits for an internationally approved vaccine to combat the ASF. This challenge sparked an urgent desire for a team of multidisciplinary professionals and academics to embark on the study, "Development of Antibodies against African Swine Fever Virus Intended for Feed Fortification to Prevent Farm-to-Farm Transmission."

For the project, collaborating researchers are led by DLSU Chemistry Professor Dr. Drexel Camacho and private researcher Dr. Faustino Icatlo, DVM, with co-proponents Dr. Manuel Granadozin, DVM from De La Salle Araneta University, Dr. Fedelino Malbas, DVM from the Research Institute for Tropical Medicine, Dr. Ma. Luisa Enriquez, Dr. Anna Karen Laserna, and Mr. Michael Ernesto Arnante from De La Salle University.

"The fortification of swine feeds with antibodies is envisioned to exert a vaccine-like effect since it introduces antibodies into the gut, thereby protecting the pig from infection via the oral route and preventing transmission. As such, our pioneering approach using antibodies hopes to be a crucial addition to the list of ASF control measures," the team noted in their paper.

## A first of its kind laboratory



With support from the Department of Science and Technology-Philippine Council for Agriculture, Aquatic, and Natural Resources Research Development (DOST-PCAARRD), Camacho's team was provided with the Animal Biocontainment and Cell Culture Research Laboratory-Level 3 (ABSL3), a first of its kind in the country.

Inaugurated on October 22, 2024, on the DLSU Laguna Campus, the ABSL3 was designed with two specific areas: The first area or the animal containment zone, where pigs are biocontained for challenge experiments. The other area is dedicated to cell culture and cell preparation, focusing on isolating the virus with its high-powered machines. The facility also features UV sterilization in almost every room.

Camacho shares about the strict protocols in the use of the ABSL3, underscoring the international standards taken to ensure safety and the containment of the virus. He says that the facility is being monitored and supported by agencies such as the country's Bureau of Animal Industries and the National Committee on Biosafety of the Philippines, aside from the DOST-PCAARRD. The team also collaborates with local farms near the facility, particularly in testing the effectiveness of the antibodies that will be administered through feeds.

The project is estimated to run for about three years, with the initial phase involving the pilot batch production of antibodies and setting of product standards; the preparation of commercial feed fortification with anti-ASF antibodies; and field trial preparation, which includes the recruitment of participating farms. The final phase will involve stability testing, field trials, and product efficacy and safety assessments.

In the long run, the research team envisions creating a viable product and putting it into the market. The goal is to boost the local feed manufacturers, who, in turn, could make it accessible, especially for small local farmers across the country. Furthermore, the researchers hope that the product will be available as well to the international market.

Beyond their project, however, the team seeks to continue contributing to the development of La Salle's research community, which will benefit from the new knowledge that will emerge from the findings of the research. "We hope to train the next generation of researchers who are capable of handling viruses, developing vaccines, and managing animal facilities," Camacho says. "We should be able to rise up as a nation and protect our countrymen from viral infections in the future."

# How can simulated drunk driving experiments help with motorcycle safety?

Pitch and roll: The movements of motorcycle drivers are being studied by a team of Lasallian researchers to detect drunk driving and improve motorcycle safety practices.

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## How can simulated drunk driving experiments help with motorcycle safety?



Injury-related data in the Philippines from 2010 to 2019 show that motorcycle drivers were prone to fatal injuries and that severe injuries among them were found to be linearly related to their blood alcohol concentration.

Data also reveal that intoxicated motorcycle drivers were more likely to be responsible for fatal single-vehicle crashes than drunk car drivers. Further, injuries among intoxicated motorcycle drivers were more severe, often affecting the head when protective gears failed to cushion the impact of collision.

These incidents of motorcycle crashes have led De La Salle University (DLSU) Research Fellow and ergonomics expert Dr. Rosemary Seva, with engineering faculty and colleagues Imanuel Luir del Rosario, Lorenzo Miguel Peñafiel, John Michael Young, and Dr. Edwin Sybingco, to look into predictors of intoxication among motorcycle drivers, mainly through their movements.



### Detecting driver intoxication

Around the world, driver intoxication is determined through a breathalyzer and the Standardized Field Sobriety Test. The latter consists of three balancing tests performed outside of a vehicle: the horizontal gaze nystagmus, walk-and-turn, and one-leg stand tests. Based on the nature of these tests, attention and balance are crucial aspects of sobriety.

In motorcycle training, a person's readiness to drive is assessed by balancing tests as well. But while it has been established that the gait patterns of drunk and sober people are distinct, the intoxicated motorcycle drivers' balance, a critical factor that influences riding stability, has not yet been investigated as a predictor of intoxication.

The researchers took this information and focused their study on the movement of the motorcycle and the driver's head. Tapping on extant literature by researchers such as Janet Creaser, who is known for her work on the effects of alcohol intoxication on motorcycle driving, the researchers worked with the theory that increased blood alcohol concentration levels significantly affect head and body movement.

In their study, the researchers monitored movements such as pitch and roll to predict intoxication among their subjects. In separate experiments, the amplitude and frequency of the drivers' head movements, as well as the motorcycle's, were observed. The researchers hypothesized that the pitch (lurching while accelerating and decelerating) and the roll (leaning angle when managing turns) would differ between the drunk drivers and non-drunk drivers.

Seva expounds: "The head movements of drunk and sober motorcycle riders are distinct. This distinction will integrate previous research findings on the relationship between intoxication and movement in the context of motorcycle driving. For example, when intoxicated, the driver's head may be angled more toward the front as visual input is decreased."

### Simulating drunkenness

Separate experiments were conducted to monitor motorcycle and head movement. Male participants

were recruited between the ages of 23 and 50 to participate in the study.

"Our participants did not take alcohol nor were they actually drunk," Seva clarifies."What we used were alcohol intoxication goggles (AIG), which simulates what a person sees when drunk. It has different levels. For this study, we used the 0.5 blood alcohol content intoxication goggles, which gives the rider a distorted view of the road. By using intoxication goggles, we can simulate the lack

of balance produced by the distortion in the images," she says.

Participants, using either AIGs or placebo goggles for control, were made to drive a motorcycle on a straight path.

Results showed that pitch and roll amplitudes of the motorcycles could distinguish drivers wearing placebo and AIGs, as well as the pitch and roll frequency of the head.

Deep learning was used to predict the intoxication of MC riders, and the predictive accuracy of the algorithm



### Applications on a smart city

Apart from possible applications for drunk-driving monitoring practices among traffic authorities, the team plans to use their findings to invent a device that would help drivers monitor their own movements.

For example, a censor can be attached to the helmet or motorcycle to monitor movement and alert the driver if his balance is compromised, whether because of drunkenness or other reasons.

"The driver may not be drunk but affected by a sudden illness while driving, such as vertigo, high blood pressure, showed a viable opportunity to use movement in monitoring drunk riders on the road.

The motorcycle rider movement experiment was conducted months ahead of the head movement experiment. Thus, lessons learned from the motorcycle movement experiment were implemented in the head experiment. The two experiments differed in terms of the number of participants and the independent variables investigated.

or a heart attack, and may not know it. A device can detect this from the driver's movements and set off an alarm," Seva proposes.

"It can also be part of your vision of a smart city. A smart city is not just technologically advanced but safe. Drunk driving does not only cause damage to property but also affects the lives of people in the community. So, we would be happy if our study could be used to develop better monitoring of alcohol intoxication on the road. That is our next step."

# How can we transform global logistics?

On the 50th anniversary of its University Charter, DLSU underscores its thrust on pioneering research with the appointment of a Balik Scientist of the Department of Science and Technology as an Honorary Golden Jubilee Professor to pursue the transformation of the global logistics sector through the concept of the Physical Internet.

# How can we transform global logistics?



Taking on the challenge to create a national innovation roadmap for the freight and logistics sector and in line with the global efforts to transform the industry by 2040, De La Salle University (DLSU) has tapped the expertise of Prof. Greg Foliente to lead the research and capability development needed to reconfigure the sector.

Foliente is an award-winning, global expert on engineering systems, hyperconnected city logistics, and interdisciplinary sustainability and resilience research. He is Enterprise Professor in the Faculty of Engineering and Information Technology at the University of Melbourne while concurrently serving as DLSU Golden Jubilee Honorary

The Physical Internet

Professor and Department of Science and Technology (DOST) Balik Scientist.

Of his work at the DLSU Advanced Research Institute for Informatics, Computing, and Networking (ADRIC), Foliente shares that the main goal is to improve the efficiency and sustainability of the distribution and delivery of physical goods across businesses, as well as the delivery from businesses to end consumers.

He points out that the freight and logistics industry in the Philippines currently faces numerous challenges, from the more general environmental concerns like high greenhouse gas emissions, noise and traffic pollution, and urban congestion, to the more specific business operations-related concerns like inefficiencies, low productivity, and wasted time and resources.

Citing examples of common inefficiencies, he says: "There are those trucks that often carry partial loads, or they return empty. There are deliveries that overlap in high-demand areas, causing congestion and redundancy. Different companies deliver similar products independently to the same destination, leading to wasted space, time, and effort. There's also the lack of resiliency from disruptions that may be natural or human-made, causing a halt in deliveries due to limited or no backup options."

To address these challenges, Foliente has embarked on the development and implementation of the Physical Internet concept for the country's freight and logistics industry.

"The idea of the Physical Internet is similar to the concept of moving digital data in the digital internet—with it, you don't need to worry about how data is sent from your phone or your computer to another person anywhere in the world; it's about sharing the resources in the best possible way to deliver the data to its intended recipient," he explains.



Emphasizing shared infrastructure and services, Foliente is pushing for standardized protocols and shared networks, similar to online data packets that allow the transfer of data efficiently and flexibly. "The goal is to optimize resource use and streamline logistics, making the system more adaptive and sustainable," he stresses.

Unlike existing models wherein companies maintain their own exclusive distribution systems or hire specific providers based on their needs, the Physical Internet logistics model enables vehicles and exchange hubs to collaborate and inter-operate across companies.

The model also highlights distribution hubs in highdemand areas for optimal product routing, provides for the operation of vehicles that match product requirements such as refrigeration, and enables disruption resilience and business continuity by making available alternate companies that can deliver the needed services in case of unplanned disruptions or extreme events.

With three layers of interconnectivity (the physical goods and transport modes; product-related data and digital information; and business processes across companies), the model encourages fair and efficient pricing and value-sharing for suppliers and buyers.

"The shift to the Physical Internet requires rethinking. It is not about a single solution, technology or platform; it requires a constellation of tools, data, technologies, and business models working together," he says.

Through ADRIC, the Enrique K. Razon Logistics Institute, and the College of Computer Studies, Foliente, as a DOST Balik Scientist, has been enjoining other disciplines (colleges and faculties) and government and industry stakeholders and making the rounds in seminars and conferences, where he shares about the Physical Internet while actively mapping the requirements to achieve the Physical Internet Vision by 2040–2050, similar to Europe and Japan, currently the only regions with such roadmaps.

"The Philippines began this process only two years ago but is now considered to be leading its development in the context of developing economies. Through an understanding of the social, regulatory, and technological needs and opportunities, we hope to contribute to the regional and global efforts for the Physical Internet transformation," Foliente says.

# Does language determine our thoughts, or do our thoughts determine language?

An associate professor from the DLSU Br. Andrew Gonzalez College of Education is taking part in an international collaborative study that seeks to find answers about language and thought by analyzing child speech across languages.

# Does language determine our thoughts, or do our thoughts determine language?



In March 2025, Dr. Aireen Barrios-Arnuco of the De La Salle University Department of English and Applied Linguistics went to ZAS, a research institute in Berlin, for a fellowship under the project "Realizing Leibniz's Dream: Child Languages as a Mirror of the Mind," also known as LeibnizDream. She made the monthlong experience an opportunity to learn not only technical skills but also valuable lessons in conducting language fieldwork involving children and their families.

Barrios shares: "Does language determine our thoughts, or do our thoughts determine language? LeibnizDream seeks to find answers to these general questions through child speech." She adds that the LeibnizDream investigates commission errors among young children in 12 targeted studies across languages investigating a number of language phenomena.

"Commission errors have not been systematically studied, much less cross-linguistically involving lesser-known languages. The literature is biased toward major languages such as German and English, and it is only recently when investigations involving lesser-known languages with complex systems have been made," she says.

Project LeibnizDream was launched in 2021 and runs for a period of six years. The project is inspired by the German polymath Gottfried Wilhelm Leibniz, who was convinced that human language is the key to understanding the human mind. Funded by the European Research Council in the Synergy Grant 2019 call under the EU's Horizon 2020 research and innovation program, its core research team is based at three host institutions: Humboldt University of Berlin headed by Prof. Dr. Artemis Alexiadou; University of Milan-Bicocca headed by Prof. Dr. Maria Teresa Guasti; and the coordinating research institute, Leibniz-Centre General Linguistics in Berlin (ZAS), headed by Prof. Dr. Uli Sauerland. Project LeibnizDream recruited collaborators for more than 50 languages from 21 different language families, two sign languages, and two creoles.

Barrios says that the large-scale project emphasizes how synergy is key with many people on the team, each specializing in a subdiscipline in linguistics. Team members come from various fields, including computational linguistics, and work on the various levels of the project—acquirer, generator, and compression groups.

Seeking to find answers about language and thought by analyzing child speech across languages, LeibnizDream brings together frameworks in formal semantics (logical aspects of meaning), generative syntax (the arrangement of words and phrases), distributed morphology (the forms of words), and psycholinguistics (linguistic behavior and psychological processes, including language acquisition). Barrios shares initial findings showing that 2-3-year-old German children use two units mit ohne "with without" to express the absence of something. The use of the superfluous "with" together with "without" is ungrammatical, but this combination, thus the use of more language material than necessary, reflects the actual structure of thought, namely, the combination of the concept "with" and the negator "not."

"Adults compress information for efficiency in communication, but children who are in the stage of acquiring a language often make mistakes by incorrectly producing more material than conventionally allowed. Examples in English morphological production are 'hitted' instead of 'hit,' 'throwed' instead of 'threw.' Called commission errors, these examples show an overgeneralization of the past tense of verbs by adding the suffix -ed to irregular verbs."



### Investigating Chabacano or Philippine Creole Spanish

Chabacano or Philippine Creole Spanish is one of the two creoles in the LeibnizDream and the only language in the Philippines selected for the project as of this time. Barrios was selected by the three principal investigators to serve as the local investigator for Chabacano.

Focusing on the Zamboangueño Chabacano variety spoken in and around Zamboanga City in Western Mindanao, she collects production and comprehension data in Chabacano, as well as demographic data, from children ages between 3-5 years and from adult controls in the farthest end of Zamboanga City, where Chabacano is vigorously used.

Creoles are formed from language contact where the process of

different languages mixing results in a new form that becomes stable over time. Chabacano has Spanishbased terms for numbers, days of the week, months, and body parts, while some grammatical properties show influences from the Austronesian language family.

For example, Chabacano exhibits a prototypically Philippinetype verb initial word order. Zamboangueño Chabacano, specifically, demonstrates the influence of Cebuano in the plural personal pronoun series, such as the nominative kame (1p, excl.), kita (1p, incl.), kamo (2p), and sila (3p); genitive pronouns diamon (1p, excl.), diaton (1p, incl.), diinyo (2p), and diila (3p); and accusative pronouns kanamon (1p, excl.), kanaton (1p, incl.), kaninyo (2p), and kanila (3p). On the pedagogical side, the project ultimately hopes to find patterns in how children acquire a first language. First language acquisition is quite thinly explored in the Philippines, and the fact that the country has over a hundred languages acquired in the home offers many opportunities to look at patterns of acquisition to inform acquisition of a second language such as English.

"It is well established that having strong skills in a first language helps children in later life, including acquisition of a second language. With proper documentation and a rigorous methodology, the project can systematically describe how our Filipino children acquire language," Barrios says.

# What does whole-ofuniversity sustainability look like?

Reflecting on the groundwork leading up to the golden jubilee of its University Charter, DLSU adopts a whole-of-university approach to its governance and sustainability.



# What does whole-of-university sustainability look like?



Sustainable development has always been rooted in De La Salle University milestones. The University Centennial in 2011 brought about the Campus Sustainability Office, the first of its kind in the Philippines. Responding to the United Nations Sustainable Development Goals (UN SDGs) and Pope Francis' Laudato Si, both established in 2015, DLSU's Vision-Mission was amended to include being "attuned to a sustainable Earth." Our Golden Jubilee as a University this 2025 is, in turn, all the more meaningful as it coincides with the 10th anniversary of enshrining sustainability into our very identity.

Reflecting on the groundwork leading up to our jubilee underscores how pivotal it is to involve all sectors to fully realize a sustainable future. Indeed, describing our approach to sustainability as "whole-of-university" reflects the Lasallian values of faith, service, and communion that have always guided our history. This year, we build upon this legacy.

As a clear demonstration of the University's commitment to sustainability, in 2023 the President's Council approved systematic organizational improvements to pave the way for the DLSU Jubilee Strategy of 2025. Foremost was the expansion and restructuring of the Campus Sustainability Office into the University Sustainability Office (USO), henceforth under the Office of the President. Led by Antonio Maralit as Executive Director, the USO oversees the implementation of the whole-of-university approach to break down silos and engage all DLSU stakeholders toward sustainability. The President also instituted the position of Presidential Adviser on Sustainability, with University Fellow Dr. Anthony S.F. Chiu as inaugural appointee.

The USO Executive Director and the Sustainability Adviser head the University Sustainability Committee (USC) and the Multi-sectoral Sustainability Subcommittee (MSS), which were similarly established to integrate circularity and the wholeof-university approach into University governance.

The USC is the high-level body that advises the President on sustainability policies and strategies. Besides the USO Executive Director as chair and the Presidential Adviser on Sustainability as co-chair, the USC is comprised of the Provost; the Senior Vice President for Finance and Administration; all Vice Presidents; the Executive Director of the Strategic Management and Quality Assurance Office; and the Executive Director of the Strategic Communications Office.

The MSS, on the other hand, is the consultative body that ensures every University stakeholder group is engaged and represented in all sustainability-oriented activities. The MSS is further organized into Clusters according to the whole-of-university approach, namely for Finance and Administration (Operations); Academics and Formation; Research and Internationalization; and Social Pillar and Community. These Clusters are composed of thought leaders and sustainability champions from all University sectors, who routinely discuss the sustainability matters that concern them to inform the policy and strategy recommendations of the USC.

Just as integral to the whole-of-university approach to sustainability are the activities at the grassroots level. Thus, the Sustainability Hubs of the Manila and Laguna campuses were formed under the USO to be the sustainability administrators, proponents, and resource centers of their respective campus communities. In fact, it is truly through the Sustainability Hubs that our wholeof-university approach is resoundingly validated.

An example of how the Sustainability Hubs have accomplished significant strides in diverting solid waste and mitigating emissions is mirrored in their multi-sectoral composting programs. In the previous academic year alone, the Sustainability Hub-Laguna successfully diverted 3,805.40 kilograms from landfills, thus preventing the emission of 123.68 kilograms of methane and 10,388.74 kilograms of CO2. Further, the Sustainability Hub–Manila, alongside the Center for Social Concern and Action through their SDG localization project for the City of Manila, has been implementing the same program for 18 partner barangays of DLSU and counting.







In our Golden Jubilee, we build upon this legacy of transformative action through our Jubilee Strategy that purposefully aligns with critical global calls-to-action. As DLSU celebrates 50 years, we affirm our unwavering commitment to not just being "attuned to a sustainable Earth," but also to actively contribute to creating that world, that future, together.

# DLSU faculty among the world's top 2% researchers based on impact

Top researchers based on cumulative career statistics

De La Salle University faculty researchers are included in the 2024 list of the world's top 2% researchers across all disciplines.

Five faculty members are included based on their cumulative career statistics.

There are 38 locally-based researchers included in the list.



Dr. Kainam Thomas Wong



Dr. Kathleen Aviso







Dr. Raymond Tan

Dr. Louie Razon

# DLSU faculty among the world's top 2% researchers

Dr. Anthony SF Chiu

### Top researchers based on 2023 statistics

Seven De La Salle University faculty researchers are included in the 2024 list of the world's top 2% researchers across all disciplines.

Only 59 Philippine-based researchers are included in this year's list.

















Dr. Raymond Tan



Scan to know more

## Distribution of DLSU's Scopus Paper by SDGs in the Past 5 Years



### Percentages of Q1 Scopus Papers of the Country's Most Research Productive HEIs

Based on records in the Scopus database as of June 2025, DLSU has been the most productive research institution in the Philippines since 2019.

Scopus is the largest abstract and citation database of peer-reviewed literature: scientific journals, books, and conference proceedings.



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