

ANNUAL REPORT ACADEMIC YEAR 2012-2013

RESEARCH @ De La Salle University



De La Salle University

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**RESEARCH @ De La Salle University
Annual Report for Academic Year
2012-2013**

RESEARCH @ DE LA SALLE UNIVERSITY

MESSAGE

Dr. Arnulfo Azcarraga

Vice Chancellor for Research

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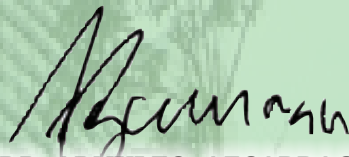
Message from the Vice Chancellor for Research

DLSU recognizes the need for research to transcend the traditional boundaries of the academic disciplines. We acknowledge that research can address social challenges through vibrant collaborations among researchers, the various sectors of society, and even international groups. The synergism can ensure positive and lasting changes in the national, regional, and global scenes.

Guided by this research thrust, faculty members at DLSU have embarked on research projects with the view of influencing policy-making and governance for an improved quality of life for the present and future generations. Through its research centers, DLSU has forged partnerships with national and international funding agencies, academic institutions, and other relevant organizations. It has strengthened existing collaborations and explored new avenues to introduce innovations and enrich existing theories, practices, and methodologies.

DLSU continues to be at the forefront of scholarly inquiry as it aims to become the leading research university that bridges Faith and scholarship in the service of society, especially the poor. We are revitalizing our efforts to provide opportunities and incentives for our researchers, and we are providing ways to translate their findings into viable solutions that can help eradicate problems in society today.

In these efforts, we hope that we truly find the Lasallian Animo.


DR. ARNULFO AZCARRAGA

COMPREHENSIVE STUDY ON PUBLICLY-FUNDED SCHOLARSHIPS AND STUDENT FINANCIAL ASSISTANCE PROGRAMS FOR POST-BASIC EDUCATION IN THE PHILIPPINES

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Introduction

The comprehensive Study on Publicly-Funded Scholarships and Student Financial Assistance Programs for Post-Basic Education in the Philippines, funded by the Australian Aid for International Development (AusAID) in cooperation with the Philippine Commission on Higher Education (CHED) and the Social Development Center (SDRC) of the College of Liberal Arts, was presented to the House of Representatives Committee on Education Joint Session in June 2012. Present during the reporting of the final results were Sen. Sonny Angara (then Representative of Aurora), who was chair of the Committee on Higher Education, Dr. Patricia Licuanan, chair of the CHED and other CHED officials.

The study was in line with the move of the Aquino Administration to make education the central strategy for investing in the Filipino people, reducing poverty, and building national competitiveness (PDP 2011-2016)

Through greater investments in education, the Government prepares graduates for globally



The Social Development Research Center (SDRC) is the research arm of the College of Liberal Arts. It seeks to fulfill the two-fold mission of serving as a hub in the Philippines and the Asia-Pacific region for research and advocacy and of forming a bridge between the academic community and the society and community it serves. Its vision is for Filipinos and the people of Asia-Pacific to enjoy an improved way of life and to live under decent conditions in an environment that accords them human dignity and respect. The SDRC's programs and endeavours have resulted in policies and projects that address identified needs. The Center has helped put up schools, generate income, organize communities, and promote better service in the areas of health, governance, and social service. By encouraging the participation of beneficiaries through capacity-building and training, among others, the SDRC has earned the trust of donor agencies and increased their faith in people's capabilities.

competitive and innovative industry and services sectors that cater not only to local but also to international markets. Higher education has the central role of preparing graduates for the workforce and, thus, of building human capital.

The Government strengthens access to quality and affordable higher education by providing assistance through various student financial assistance programs (FAP). However, despite such provision, the inadequate supply of labor force still remains. Major reforms are henceforth needed to strengthen the provision of scholarships/financial assistance programs for post-basic education and to improve its equity, efficiency, and effectiveness.

Sound reforms can only be made, however, if there is a basis for implementing such reforms. This study was therefore conceived to generate primary and secondary data that would enable lawmakers to execute needed reforms. It evaluated the current system of financial assistance programs funded by the Philippine government.

The general objective of the study was to assess existing publicly-funded scholarships/financial assistance programs for post-basic education in terms of equity, efficiency, and effectiveness (3Es) considerations and to provide empirical evidence to be used for the crafting of a comprehensive legislation on a rationalized system of publicly-funded scholarship and financial assistance programs in post-basic education.

Findings and Data Implications

On Scholarships/Student Financial Assistance Programs, Government Agencies, and Enabling Laws

Ten national government agencies, one State-run higher education institution, and one government financial institution supplied data for the survey of the type, nature, and

instrumentalities of their scholarship and student financial assistance programs. These were the Commission on Higher Education (CHED), Technical Education and Skills Development Authority (TESDA), Department of Agriculture (DA), Department of Environment and Natural Resources (DENR), Department of Health (DOH), Overseas Workers' Welfare Administration (OWWA), Department of Labor and Employment (DOLE), National Commission on Indigenous Peoples (NCIP), Department of Science and Technology (DOST), Department of National Defense (DND), Mindanao State University (MSU), and Government Service Insurance System (GSIS).

The national government agencies provided the data regarding student financial assistance programs. The scholarships/student financial assistance programs for the period 2007 to 2011 according to types were scholarships (62%), grants (36%), and loans (2%).

During that same period, more than three-quarters (79%) of the scholarship programs of the various agencies were competitive (e.g. Full Merit, Half Merit, One Team, One Scholar, Department of Science and Technology-Science Education Institute Undergraduate Scientific Manpower Development Program (DOST-SEI USMDP)) while the rest were in the form of entitlements (e.g. TESDA Training for Work Scholarship Program). Regarding the grants programs, only less than a quarter (22%) were competitive (e.g. *Tulong Dunong*). Moreover, the number of scholarship programs was constant in those five years except for the CHED which had a slight reduction. The DA had no scholarship program prior to 2011.

The study also reveals that the scholarship programs constituted the majority of the share with 92.5% of the total allocations, grants programs had a share of 6%, and loans had the lowest share of 1.5%. The total scholarship programs allocation as reported by the agencies increased by 120% in 2008 from the total allocations of P1,010,107,949 in 2007.

This continued to increase in 2009 by 192% from the 2008 allocations (i.e. the highest increase in scholarship allocations during the five-year period). A significant reduction of 63% in the scholarship allocations was observed between 2009 and 2010; however, an increase was noted from 2010 to 2011, but at a very small percentage of less than 2%.

Grants allocations of agencies implementing grants programs increased steadily from 2007 to 2009. Noted were the highest increase between 2008 and 2009 with about 19% and the lowest between 2007 and 2008 with only less than 2%. Just like the scholarship allocations, grants allocations significantly dropped in 2010 by more than 15% from their 2009 values. The loan allocation by the CHED increased from 2007 to 2010 with a geometric mean of 80.61%. The highest rate of increase (262%) was observed between 2007 and 2008, and the lowest rate of increase was from 2009 to 2010 (i.e. 25.73%). In more recent years (i.e. 2010 to 2011), the loan allocation was reduced by 13%.

Increases in scholarship allocations as adjusted for inflation varied per agency. In 2008, the allocation for scholarship programs increased in all agencies. In 2009, the CHED, TESDA, NCIP, and DND continually increased their allocation, with the CHED and TESDA's allocations increasing at a much higher rate compared to the previous year. The TESDA had a dramatic increase of four times the allocation in the previous year. However, the DOLE, OWWA, and DENR's allocations declined. In 2010, the CHED, DOST, and DOH's allocations increased, but at a much lower rate. The TESDA, NCIP, and DND's allocations declined, and the DENR's allocation also continued to drop but at a lower rate. Unlike the previous year's decline, however, the DOLE and OWWA's allocations increased, with such pattern being observed until 2011, even as all other agencies' allocations declined and the CHED's allocation increased only at a lower rate.

The growth of the CHED's grants allocation increased in 2008 and 2009 but declined in 2010. Relatively, the DOLE's growth in grants allocation increased dramatically in 2008 but was not sustained in 2009. The DA's grants allocation continuously decreased during the five-year period.

Lastly, the various student financial assistance programs were created by virtue of either a republic act (RA) or an internal instrumentality like a department order (DO). For example, the CHED's student financial assistance programs were initiated through RA 7722 (Higher Education Act of 1994) while that of the DOST was initiated through RA 7687 (*Science and Technology Act of 1994*). The benefits covered by scholarship programs varied from one agency to another and even within programs. All scholarships, however, would at least assure the beneficiary's school fees, which may be covered fully or partially. Other scholarship programs – such as that of the DOST-SEI USMDP – included transportation expenses, book, and clothing allowances, and monthly stipends.

Current Operations of Scholarship, Financial Appropriation, Targeting of Beneficiaries, Selection Process, Tracking System, and Payment Recovery System

With the use unadjusted values, it was determined that increases in the scholarship allocation of the agencies were connected to the growth in their number of scholars. However, there was no statistically significant association with the growth of the amount received per scholar, suggesting that the increases covered only the effect of inflation.

In relation to the need to increase the amount received per scholar or the value of scholarship, an ordinary least square (OLS) regression was used to determine the effect of *tuition fee per scholar per semester*, *book allowance per student per semester*, *stipend per*

student per semester, and dummy variables to account for the region (Luzon, Visayas or Mindanao) on the number of DOST scholars per school year. Increasing the tuition fee allotted for scholars would result in a .02% increase in the number of scholars. In the same way, allotting more slots in Luzon and Visayas, would lead to more students who could avail of the scholarship.

Efforts to publicly disclose scholarships came from the sources (i.e. agencies), but downstream (e.g. Higher Education Institutions or HEIs, these were constrained because of poor information dissemination strategies that relied mainly on word-of-mouth and bulletin board postings, as reported by the scholarship coordinators of 40 selected State Universities and Colleges (SUCs) across all regions.

The concerned agencies created guidelines and criteria for the process of selection. However, interview data revealed that such were not actually observed and there was no oversight mechanism to ensure compliance. Interview data also suggested that in some cases, personal and political influences affected the selection process. In fact, the CHED did not monitor the manner in which scholars were selected by some members of the House of Representatives, and the DBM's reporting of *Priority Development Assistance Fund* (PDAF) releases divulged only information on project and location, amount, implementing unit and release date. There was a noticeable absence of tracking system(s) among the agencies implementing the financial assistance programs. To date, there has been no tracer study being done on this.

Regarding loans, there was no institutionalized repayment system (e.g. no agency tasked to monitor the compliance of repayment by loan recipients). Scholarships with a "return of service" requirement like those of the DOST and the DOH were coordinated with the National Bureau of Investigation (NBI) and the Bureau of

Immigration and Deportation (BID). In a seemingly coercive move, scholars were blacklisted in these agencies to ensure that they would stay in the country.

Cost-effectiveness was determined using *translog cost function* and showed that SUCs exhibited economies of scale, which meant that the total cost would not increase if the SUCs decided to expand their operations. Moreover, the SUCs exhibited economies of scope, which meant that an institution would be more cost effective if it offered various programs—in this case, the undergraduate and graduate programs.

The Scholarship System, National Objectives, and Industry Supply and Job Mismatch

Significant predictors of the number of certified TESDA graduates included (a) the total cost allotted by the TESDA, (b) the value of educational supplies, (c) the number of graduates, and (d) the number of slots allocated for scholars.

The agencies' structure of scholarship programs as currently implemented has a tendency to be biased toward high-end or top-tiered industry needs (i.e. scientists). Thus, there is underemployment because the scholarship programs groom professionals who are less demanded by industries. Related to this, there is a lack of concerted effort to provide meaningful financial assistance to vocational-technical students, who are highly demanded by industries. In 2009, however, there was a dramatic increase of 400% in the funds allotted to the TESDA.

The policies governing the implementation of the scholarships are limited only to the promotion of previously defined priority courses. There is no mechanism for dialogue or consultation with industries on which to base the identification of courses more appropriate to the needs of industries. This

is a confirmation of the DOLE's *Project Jobs Fit 2020* findings, which reported that one of the three main concerns in propelling the industry with a skilled labor force was the poor dissemination of labor market information.

To be able to meet industry needs in the future, scholarships to address the needs of the blue-collar workforce should therefore be emphasized and given higher priority, in addition to scholarships at the collegiate/baccalaureate/graduate levels. However, the implementation of the K-12 program requires a change of the “discourse” on post-basic scholarships to target even Grades 11 and 12, particularly for the vocational-technical stream.

For an industry-academe partnership, the government must allow industry to define its needs and communicate these to academe and to scholarship-implementing agencies. In doing so, industry and the CHED will be able to determine the optimal mix or number of professionals needed within a certain discipline and then design scholarship and academic programs based on it (i.e. a Comprehensive Master Plan).

International Good Practices and their Relevant Measures Adoptable in the Philippine Context

In the *United States of America*, scholars, particularly those in the graduate school, are required to become research or teaching assistants to enhance their research and teaching skills. If this practice is adopted in the Philippines, it can:

- increase the effectiveness of scholarship programs by developing the capacity of scholars to render service, even while they are under scholarship (i.e. increase in the positive externality of the investment in scholarship);
- increase the employability of those who are not currently employed as their service will also provide them with relevant experience in teaching and/or research.

In addition, linkage/on-the-job training (OJT) with the industry and private sectors can be designed as an alternative to teaching and research assistantships for possible employment of students in these sectors.

In *Australia*, all scholarship programs are harmonized and governed by only one handbook. Applying this centralized system in the Philippines can increase efficiency of operations because it can address the biases in the country's current system of informing and disseminating scholarship and student financial assistance programs.

In *Singapore* and *Australia*, scholarships are also given based on the leadership, teaching, and research potentials/abilities of the scholars. Adopting such bases in the Philippines for degree or non- vocational programs will increase the efficiency and effectiveness of these programs and optimize the allocation of government funds to recipients who are more likely to finish their education and be employed. A different approach must be taken for vocational technical programs where entrepreneurial skills, instead of research and teaching potentials, could be a consideration.

In *Vietnam* and *Singapore*, government scholarships are also obtained from diversified sources of funding. Should this be pursued in the Philippines, the private sector must be invited or enticed, either by legislation or a stress on corporate social responsibility, to contribute directly to funds for scholarship. This will consequently contribute to increasing the effectiveness and efficiency of scholarship operations.

As earlier suggested, private-public partnerships can also be forged through being partners/hosts of OJT, which is now proposed

as a requirement in lieu of teaching and/or research assistantships.

Student loans programs across the world. Good practices of student loan schemes take into account the following:

- They should be aimed at achieving a national impact.
- They should have clear-cut policies that define eligibility criteria and other provisions.
- There should be alternative policies available that meet the same objective.
- So as not to burden the newly employed grantee, an income-contingent repayment scheme—which most developing countries prefer, rather than a fixed-term mode of repayment—should be implemented.
- Generally, centralized loan schemes and unified loan and grant policies are preferred over multiple schemes if and when the primary concern of the implementing body is the efficiency and effectiveness of the student loans program. On the other hand, the latter is preferred in cases where there are different objectives to meet and when the need to tap alternative loan funding arises.
- To cater to the needs of marginalized communities, government funding for initial loan capital, sustainability, and subsidy is favored over commercial banks.
- The ratio of repayment rate should be at par with the loan recovery level.
- There should be justification of subsidized loans and congruence of the amount of loan with the needs of the recipient.
- Horizontal equity should be practiced in selecting the recipients (e.g. giving equal chances to the applicants and matching the loan size to the needs of the grantee).

- A pro-active stance should be taken in selecting the recipients (Rather than waiting for them to apply for the program, sponsors should target or identify the recipients.);
- A technical working group or body should be commissioned to evaluate the loans program.

Lessons from other countries. The Philippines can draw on the experiences of other countries.

- *China's* funding is provided for by the banking system, which explains the high repayment rate of 79%. The country's venture to partner with commercial banks seems promising. However, its loans system has a weak national impact, with difficulties in repayment collection due to a heavy repayment burden. Moreover, the scheme expansion seems limited.
- In *South Korea*, multiple schemes are provided due to diverse objectives. Loan recovery and repayment ratios are relatively at par, and like China, the government has partnered with commercial banks. On the other hand, the multiple approaches raise issues on integration, low coverage of programs, and a substantial scheme for public officials.
- *Thailand* has an extensive coverage of upper secondary and tertiary student groups, and the country's loan scheme restructuring is in the public agenda. Since the coverage is extended, the scheme has weak central control and default sanctions. Akin to what has happened in the Philippines, Thailand experienced lack of funding, which resulted in the retrenchment of the scheme. Minimal loan repayment and recovery were also observed. Marginalized communities were poorly targeted and horizontal inequities are prevalent.

Pending Bills in Congress vis-à-vis Harmonization of all Publicly-funded Scholarship Programs

There have been many bills on scholarship and student financial assistance programs filed in both Houses. Most bills propose new programs, while others propose amendments (e.g. HB 88 seeking to amend the Government Assistance to Students and Teachers in Private Education or GATSPE Law. Reconciling these bills with existing laws into an *Omnibus Student Financial Assistance Code* should be done with recognition of several challenges. Definitions are crucial in forging a clear and feasible set of mechanisms for selection and implementation. Moreover, in terms of administration, the question of whether there should be one agency to oversee the implementation needs to be addressed.

Although the challenges listed above are ideal, answers to the following considerations may lead to a successful harmonization agenda:

- How can harmonization be achieved without sacrificing diversity of contexts, needs, and institutional capacities?
- What are the implications of the implementation of the K-12 program?
- In what ways can public-private partnerships be realized?
- Should it be optimal to use government funds for scholarships only for those beneficiaries who are deserving and most likely to finish their education and later on serve the country?

Legislative Proposals Covering Post-Basic Education Scholarships and Financial Assistance Programs (PESFAP)

For the harmonization of laws, the following requirements may be considered:

- There should be one law – with common definitions, harmonized mechanisms, and procedures – but several programs targeting different sectors and needs.
- There should be one agency (but not necessarily a new government unit.) It could be an office under the CHED to serve as the coordinating body, assisted by an Advisory Council composed of agencies involved in the implementation of financial assistance programs.
- Fund sources should no longer be limited to the General Appropriations Act (GAA) but should include public-private partnerships.
- For graduate programs, teaching/research assistantships and industry internships (OJT) should be included as part of the requirement.
- Leadership, research, teaching, and entrepreneurship potentials should be included as the basis for selection of recipients.
- To harmonize with K-12, Grades 11 and 12 should be part of the coverage, particularly for TESDA programs.

TOWARDS A GREEN EDUCATION IN THE PHILIPPINES

Dr. Shirley O. Lua

The 21st century faces severe environmental crises. We know this in view of the recent drastic shifts in the world climate caused by global warming. We recall several recent tragedies in our own country brought about by natural calamities—the staggering deluge and damages caused by Typhoons Frank, Ondoy, and Sendong; the heart-wrenching devastation of cities by Yolanda and the storm surge; and the terrifying effects of the Bohol earthquake, among others.

One of the most imposing challenges of today is the re-creation of a sustainable planet. Environmental sustainability and climate change adaptation are essentially about behavioral transformation. Education has a deep-seated responsibility in retrofitting its practices and resources for the learners who can become conscientious associates in the re-building of a green and sustainable future.

Towards a Green Education in the Philippines: Perspectives, Pedagogies, Performances (a.k.a. *Green Education Festival*) was held as an affirmative response to the aforementioned concern. It is comprised of three main components: colloquia/provocations, teaching workshops, and



Established in 1991, the **Bienvenido N. Santos Creative Writing Center (BNSCWC)** continues to be at the helm of De La Salle University's effort to preserve the tradition of excellent creative writing and research in the country. It is one with DLSU in the belief that quality writing is best cultivated in the spirit of vital engagement with tradition and innovation—decisive moments in the making of a nation's literary and cultural heritage.

Founded in honor of the late Filipino-American writer Bienvenido N. Santos, the Center provides programs that serve as venues for the academic community to critically and creatively explore the writing process. At the forefront of this exchange are highly respected and award-winning writers who are invited both from within and outside of DLSU to share the techniques of their craft in workshops, lectures, conferences, and literary readings.

The Center keeps abreast with the interplay of the national and international literary environment as it sees itself playing an important role not only in enriching the La Sallian community's cultural life but the larger community as well. It has actively participated in literary festivals and hosted foreign writers in the interest of learning more about other cultures' literary traditions and developments. It is also committed to serving the local community's cultural life through programs and activities that contribute to the dynamic production of Philippine writing.



performances. It sought to gather together teachers/educators, scholars, artists, researchers, and social practitioners from the Philippines, and even from Asia Pacific, providing them a forum to discuss ideas and strategies on the conduct of environmental engagement in the humanities and social sciences classrooms of HEIs (higher education institutions).

Its two-fold aim was (a) to encourage the core courses of the New General Education Curriculum (CMO No. 20-s2013) to re-examine their vital connections to people, cultures, and places beyond the walls of the university and (b) to transform the learners of today into critical mass and innovative forces that work together towards a green, productive, and sustainable future.

The festival was held in three legs in three different regions of the archipelago. The Metro Manila leg took place on 24-26 October 2013 at De La Salle University (DLSU), Manila. The Mindanao Leg was held on 20-21 June 2014 at La Salle University (LSU), Ozamiz City, Misamis

Occidental, and the Visayas Leg on 27-28 June 2014 at the University of San Agustin (USA), Iloilo City.

This project was spearheaded by the DLSU Office of the Associate Vice Chancellor for Faculty Resources and Development, the Bienvenido N. Santos Creative Writing Center (BNSCWC), and the Behavioral Sciences Department. It was supported by the United Board for Christian Higher Education in Asia; the DLSU Office of the President; Office of the Vice Chancellor for Research and Innovation; External Relations and Internationalization Office; and the College of Liberal Arts, Office of the Dean. DLSU's partners included the LSU Office of the Vice Chancellor for Academics, the USA Graduate School, and the USA Institutional and Special Projects Office. The convenors were Dominador F. Bombongan Jr., Romeo Lee, Dennis Erasga, and Shirley Lua.

For the Metro Manila Leg, the keynote speakers were Dr. Francisco B. Benitez, President of Philippine Women's University, on "The Sustainable Humanities: The Humanities



Education as Specie of Ecology” and Dr. Hiko Tamashiro, Professor of Hokkaido University, on “The State of Knowledge Regarding the Environment and Teaching as Potent Venue for Designing Transformative Courses and Educational Paradigms.”

The colloquia dealt with two specific themes: art imagining the future and local myth as environmental discourse, media and the environment. The speakers included Archt. Paulo Alcazaren, Australian poet Stuart Cooke, Thai social scientist Kanang Kantamaturapoj, screenwriter and anthropologist Ramon Felipe Sarmiento, and media communication specialist Gregg Yan of the World Wide Fund for Nature (WWF-Philippines). The chairs for the art and media colloquia were Elenita Garcia and Feorillo Petronilo Demeterio III.

The second day activities focused on workshops on teaching the environment in the various courses of the liberal arts education. The facilitators and their topics were Daylinda Banzon-Cabanilla (ethnographies of nature, affiliated with University of the Philippines); Remmon Barbaza (philosophy of environment, Ateneo de Manila University); Antonio Contreras (environmental politics, De La Salle University); Dennis Erasga (literary environmentalism, De La Salle University);

Dennis Gonzalez (nature as divine art, Ateneo de Manila University); and Lars Raymund Ubaldo (history and environment, De La Salle University).

Performances served as the culminating activities on the third day. *Read Green Sing Green: Poetry and Music for the Environment* was held at the DLSU Little Amphitheatre. Participating poets and artists included Genevieve Asenjo, Romulo Baquiran Jr., Nonon Carandang and the Neo Nocturne choir, Australian poet Stuart Cooke, Carlomar Daoana, Johann Vladimir Espiritu, Genaro Gojo-Cruz, Francisco Guevara, Mookie Katigbak-Lacuesta, Marne Kilates, Joel Malabanan, Vietnamese poet Nguyen Que Mai, Ned Parfan, Kay Blanca Rivera, Dinah Roma, Manolito Sulit, Ramón Sunico, Joaquin Sy, Jimmy Tagala Jr., John Iremil Teodoro, Santiago Villafania, and Martin Villanueva. Farida Kabayao served as the director and performance designer.

This poetry and music suite was also an assertive response to the World Poetry Movement’s (WPM) call for a poetic global action by holding simultaneous readings across the earth. WPM was founded in the context of the World Gathering of Directors from 37 International Poetry Festivals in Medellin, Colombia in 2011. WPM supports “the thoughts,



actions, and measures that can contribute to world peace, the defense of all life on earth, the sustainable development of a new world, the restoration of beauty, dignity and truth, in the process of a persistent strengthening of poetry's presence in contemporary society worldwide."

Aside from the recital, Ray Defante Gibraltar's film *Syokoy* and Oscar Nava's film *Hupa* were screened at the DLSU Yuchengco Hall on October 26. *Syokoy* portrays the catastrophic aftermath of the Guimaras oil spill, i.e., the MT Solar I tanker accident, which occurred on August 11, 2006. The tragedy resulted in the poisoning of the sea, the destruction of nature, and the disintegration of humanity. *Hupa* (Nightmare) depicts the flood horrors and urban devastation inflicted by Typhoon Frank in June 2008. This Hiligaynon documentary received the highest recognition –Grand Charlie Award– at the 2008 Moonrise Film Festival.

In the evening, theatrical performances were held at the lobby of Henry Sy Sr. Hall to formally close the Metro Manila Leg. The La Salle Dance Company (Folk) rendered a series of elaborate and colorful dances on the environment while the Harlequin Theater performed "Alaala Kay Infanta" (In Memory of Infanta), an interpretative dance drama

about the landslide and flash flood tragedy that occurred in Infanta, Quezon.

In response to two emerging changes in Philippine education and environment in the latter part of 2013, the organizers decided to re-format the Green Education Festival. The first change was the official approval and issuance by the Philippines' Commission on Higher Education (CHED) of the memorandum CMO No. 20-s2013, designating eight core courses for the New General Education Curriculum (NGEC). The core courses are "inter-disciplinary and... stated broadly enough to accommodate a range of perspectives and approaches." This was an affirmative development which buttressed the objectives and goals of the Green Education Festival. We raised questions, such as: Can environmental topics, issues, and concerns be integrated into these core courses? Can the HEI classrooms serve as training grounds to enhance students' awareness for problems that affect the world and the natural order of things? For instance, *Art Appreciation* can evoke narratives and images of disaster and recovery; *Philippine History* can deal with colonialist interventions that brought about environmental destruction; *The Contemporary World* can examine current ecological problems and the impact of human activities

on the environment; *Science, Technology and Society* can ponder on how technological developments have served as instruments to destabilize the ecosystem or to mitigate environmental impacts.

The other change was the unheralded massive devastation caused by Super Typhoon Yolanda (international name: Haiyan) on select regions in the Philippines. This, of course, was not the first of its kind in the country, which had frequently experienced in recent years



the terrifying onslaughts of natural calamities (e.g., Typhoons Frank, Ondoy, Sendong, Pedring; and earthquakes in Bohol and central Visayas). Yolanda's horrifying havoc had awakened the Filipino people's realization of the reality of climate change. This, ironically, might spur a sudden and widespread interest in environmental education in the Visayas and Mindanao. The Green Education Festival, in other words, had become ironically a well-timed project.

Renamed *Towards a Green Education in the Philippines: Workshops on Teaching the Environment and Climate Change Impacts in the New General Education Curriculum*, the Mindanao and Visayas Legs had a revised format for the two-day workshop, such that the morning sessions were devoted to provocations and fora. The resource speakers came from different disciplines. Thus, a varied array of perspectives was presented to the audience-participants, who came from all walks of disciplines.

In the Mindanao Leg, the speakers were District Manager of Climate Reality Project Philippines Rodne Galicha (whose background was philosophy and theology), top marine scientist Wilfredo Roehl Licuanan (De La Salle University), chemical engineer Esmael Larubis (La Salle University Ozamiz), local historian and social scientist Rolando Borrinaga (University of the Philippines), and environmental science scholar Dennis Erasga



(De La Salle University). In the Visayas Leg, the speakers were local historian and social scientist Rolando Borrinaga (University of the Philippines), philosopher and visual artist Bro. Jaazeal Jakosalem, OAR (University of Negros Occidental-Recoletos), environmental scientist Roel Alli (West Visayas State University), and chemical engineer and sustainability development scholar Raymond Girard Tan (De La Salle University).

The afternoon sessions were allocated for the action program workshops. Each group was given a text (e.g., Google satellite photo of Haiyan over the Philippines, a poem in English by Merlie Alunan entitled “Haiyan Dead,” and a poem in Cebuano by Grace Monte de Ramos entitled “How Do You Read the Clouds”). A group discussion ensued, with participants sharing what the text meant from their discipline. Each group also synthesized the varied perspectives that they uncovered from their textual reading. They also considered, in particular, the text reading which they found to be the most surprising and challenging to their current thinking.

The second-day workshop session focused on the processing of group reflection. The guide questions were:

- 1) What did you find striking about the process of group reflection and discussion?
- 2) How does this process compare with current classroom teaching practices?
- 3) How much of this process can be done in the classroom? What does this process entail in terms of teacher preparation, lesson preparation, and student readiness?
- 4) What did this process show you about learning in a multi-disciplinary way?
- 5) What aspects of this process would you be interested in exploring as part of your teaching?

The workshop facilitators were Marjorie Evasco, Miguel Rapatan, Romeo Lee, and Dennis Erasga. The participants in the Mindanao Leg included teachers and educators from various disciplines of the HEIs located primarily in northern Mindanao region. The Visayas Leg included teachers and educators from various disciplines and from various places in the Visayas region, with the participation of a few environmentalists.

The workshops were also complemented by performances. In the Mindanao Leg, LSU Chorale and theatre group Danen-o performed their musical and dance renditions on the environment. In the Visayas Leg, the USA Little Theater under the direction of Eric Divinagracia performed excerpts from *Imagine/a/nation*, a theatrical response to Yolanda. *Read Green!* featured established and prize-winning poets Marjorie Evasco, Isidoro M. Cruz, Ulysses Aparece, Marcel Milliam, and Erwin Sustento, who recited poems about nature and the environment.

The framework of the festival/workshop was transdisciplinary/interdisciplinary, even multidisciplinary. This was achieved by ensuring that the festival/workshop had a range of resource speakers from various disciplines, including the natural sciences and engineering, and that the composition of the audience showed a diversity of disciplines and backgrounds. Thus the synthesis presentations of the audience during the workshops, particularly in the Visayas Leg, manifested a fusion of ideas and perspectives culled from diverse backgrounds and experiences. In the evaluation of the workshop, participants echoed these through their comments, such as: “Multi-dimensional knowledge on Green Education,” “Use of multidisciplinary approach and solution ecosystem,” “The process of imparting a content which is multidisciplinary. I was challenged to apply this process in the making of projects or activities to my students,”

among others. The humanities and social sciences, as one convenor concluded, should “ally” themselves with the natural sciences.

In its modest endeavor, the festival has informed groups of learners–teachers, educators, social practitioners, environmental enthusiasts, and students–in select regions of the Philippines on the significance of environmental education in the curriculum, and how certain courses should be re-designed as a way to re-examine their vital connections to people, cultures, and places. The transdisciplinary/interdisciplinary/multidisciplinary framework could help in creating a holistic understanding of environmental challenges as humanistic and social issues that can be addressed by tertiary education. The interconnection of themes, through environmental concerns and issues, are evident from the various disciplines. As one participant observed, “Environmental awareness/education is inter-disciplinary and

involves practically everyone.” Accordingly, the teachers-participants will initiate the integration of environmental issues in their courses, or in the forthcoming NGEC, and therefore take affirmative action in transforming the learners of today into a critical mass and innovative force that will work together towards a green and sustainable future. The Green Education Festival will hopefully create a ripple effect.

We sum this up with a quote from Thom Hartmann, author of *The Last Hours of Ancient Sunlight*: “The problem is not a problem of technology. The problem is not a problem of too much carbon dioxide. The problem is not a problem of global warming. The problem is not a problem of waste. All of those things are symptoms of the problem. The problem is the way that we are thinking. The problem is fundamentally a cultural problem. It’s at the level of our culture that this illness is happening.”

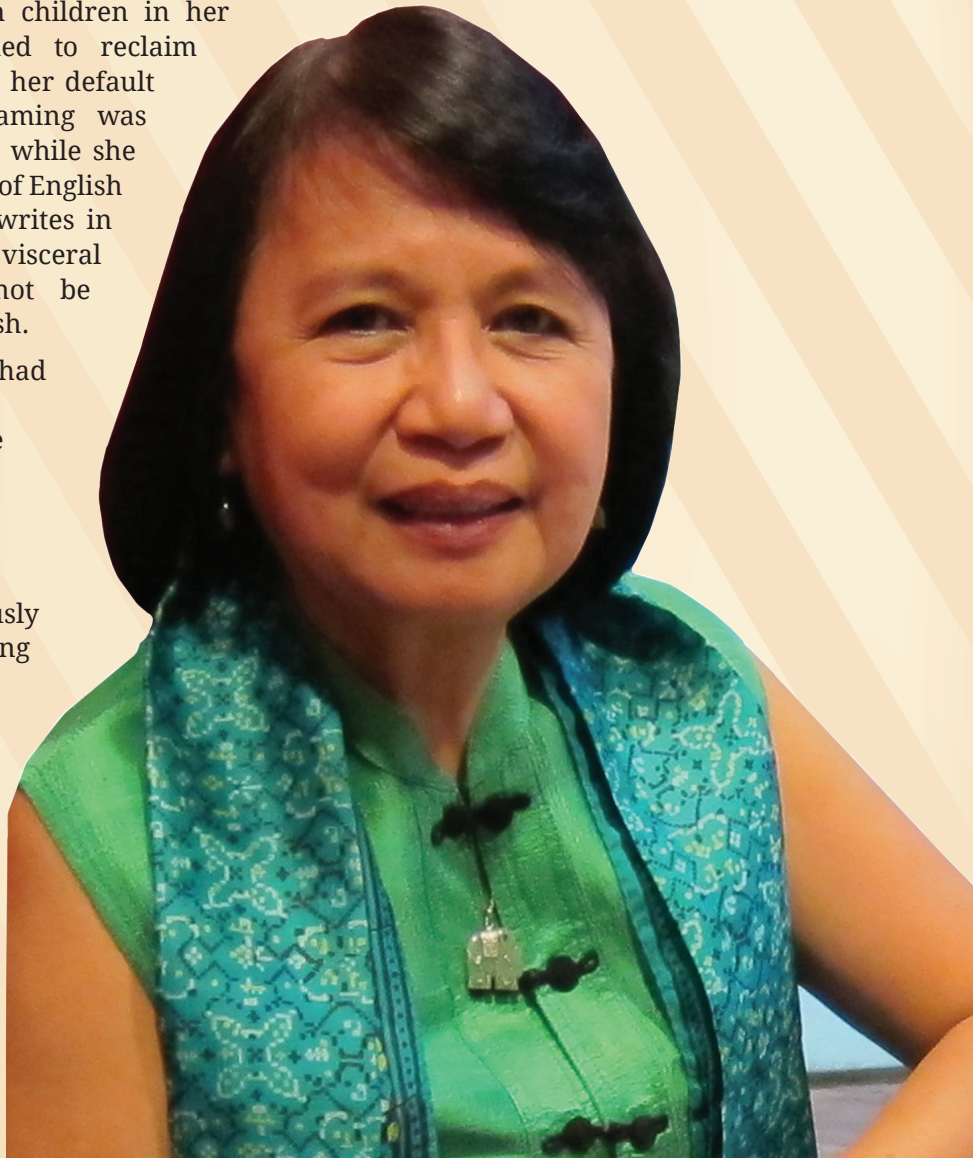
Featured Researcher

Dr. Marjorie M. Evasco-Pernia

Born to a family of teachers, farmers, and mat weavers in the historic town of Maribojoc on the island of Bohol, Marj must have met the Muse in her youth in the rich culture of her people and her picturesque home island, made even more captivating by its white sand coastline and the majestic mountain range of Maribojoc. Initially inspired by teacher-poet Merlie Alunan to set her foot onto the path of writing, Marj later found herself and takes pride at being mentored by no less than Philippine National Artist for Literature Edith L. Tiempo.

Throughout her growing years, Marj was accustomed to reading and writing in English in school, and using Cebuano in her interactions with children in her neighborhood. Before she decided to reclaim her mother tongue in her writing, her default language for thinking and dreaming was English. She claims, however, that while she enjoys the fluidity and malleability of English in writing poetry, it is when she writes in Cebuano that she is in touch with visceral and spiritual depths that cannot be translated into or sounded in English.

In a recent interview that Marj had with poet Usha Akella in Granada, Nicaragua, the latter asked why she chose poetry. Marj who describes poetry as “basically an oral and an aural art... a form malleable in the wind that carries human speech to the ear of the listeners” spontaneously replied that she likes “words that sing in a beautiful, intelligent form,” adding that she “delights in reading poems that see, sense and sing about particular things that configure newly recognized relationships,” a recognition that Longinus calls the ‘transport to the sublime.’



Thus, when Marj writes poems, she tries “to recreate that pleasure for herself, to hear a voice sing of wing, fin or petal catching a sliver of light.”

Receiving an award from all the prestigious literary award giving bodies in the country, on top of several other local and international recognitions and citations, are clear evidences that she “carries a *musa*” that have made her succeed in writing poems that have recreated that pleasure, not only for herself but also for her readers. Among the awards she had received are: the Ani ng Dangal Award for Literature (on the occasion of the 2012 Philippine International Arts Festival); Philippine Free Press Literary Awards (2nd Prize for Poetry) for *It is time to come home* (2010), *Luna’s Lost Earrings* (2008), and *Rim of Fire* (1992); Manila Critics’ Circle Alfonso T. Ongpin National Book Award for Best Book on Art for *ANI: The Life and Art of Hermogena Borja Lungay, Boholano Painter* (2006), National Book Award for Biography for *A Life Shaped by Music: Andrea Oflada Veneracion and the Philippine Madrigal Singers* (2001), National Book Award for Poetry for *Ochre Tones: Poetry in English and Cebuano* (1999), National Book Award for Oral History for *Six Women Poets: Inter/Views* (co-authored with Edna Manlapaz) (1996), and National Book Award and Book Development Association of the Philippines Gintong Aklat Award for *Dreamweavers: Selected Poems* (1976-1986, 1987); Unyon ng mga Manunulat sa Pilipinas Gawad Pambansang Alagad ni Balagtas for Poetry in English and Cebuano (2004); Don Carlos Palanca Awards for Literature for *Threading Our Lives, or The Story of the Open Strand* (First Prize, 1989), *Ludic Pleasures of Eating Words* (Second Prize, 1994), and *Tertulias at San Jose and a Family Album* (Third Prize, 1983); 8th Gawad CCP Awards for Alternative Films and Video for *Asong Simbahan* (First Prize-Filmsript, 1994); and Philippine Literary Arts Council Caracoa Best Poetry award for *Hua Mu Lan Greeting Her Spirit-Husband (after meeting him at the Gobi Desert)* (1989).

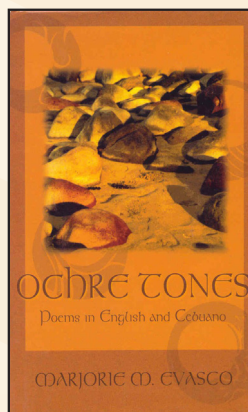
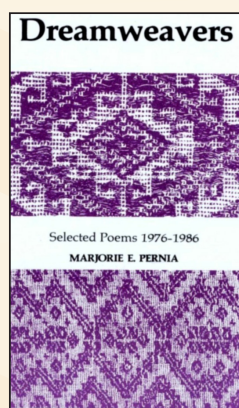
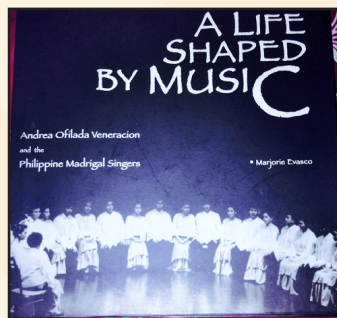
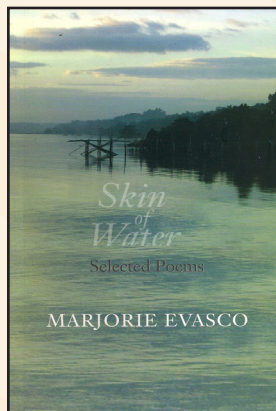
The other award-winning books that she authored or co-authored are: *Fishes of Light: Tanrenga in Two Tongues/Peces de Luz: Tanrengas en dos idiomas*, co-written by Cuban poet Alex Fleites (2013); *From the Blood of Martyrs: Rebuilding and Development of De La Salle College: 1946-1971* (2011); *Skin of Water* (Selected Poems in English and Spanish trans.) (2009); and *Legacy of Light: 100 Years of Sunlife in the Philippines* (1996).

Marj who admits that her writing is “still in the process of fulfilling its own evolutionary imperatives” has been blessed with several opportunities to further refine her craft, which include: a Visiting Writer grant for the International Writers’ Workshop (Hong Kong Baptist University, October–November 2013); National Commission for Culture and the Arts (NCCA) Artist’s Travel Grants for the 7th Ubud Writers and Readers Festival in Bali Indonesia (October 2010), the 6th Granada International Poetry Festival in Nicaragua (February 2010), and XVIII International Festival de Poesia in Medellin, Colombia (2008). She was Philippine representative to the July 2012 Poetry Parnassus Festival (Southbank Centre, London, for the 2012 Olympics) and a S.E.A. Write Laureate 2010 for the Philippines in Bangkok, Thailand (November 2010). She was also a participant/participating poet/Philippine representative at the following events: Philippine Educators’ Immersion Program in Buddhist Studies at the Fo Guang Shan Monastery and Fo Guang University in Taiwan (2013), the 12th Sydney Writers’ Festival in Australia (2009), “Continents of Creation: Asian-African Writers’ Conference” in India (2006), Man Hong Kong International Literary Festival (2006), and 1st World Feast Poetry Festival in Singapore (2004), among several others. She is also cited in the *Encyclopedia of Post-Colonial Literatures in English*, Vol. 1:462 Eds. Eugene Benson & L.W. Conolly, and London: Routledge (1994).

On top of the foregoing, she had received writing fellowships and residency grants, which have further enriched her experience, broadened her perspective, and given her time

to sojourn with the Muse. She was an honorary writing fellow at The International Writing Program–University of Iowa, USA (August–November 2002) where she read poetry, gave public presentations, and lectured on Contemporary Philippine Literature in English; and was a British Council Fellow at the Cambridge Conference on Contemporary British Literature in England (July 1996). She was awarded a writing residency at the Bellagio Conference and Study Center by the Rockefeller Foundation in Bellagio, Italy (1992) and at the Hawthornden Castle International Writers Retreat at Midlothian, Scotland (May-June 1991). Apart from these, she received a visitorship grant to England and Scotland from the British Council (May to June 1991) and a grant as visiting scholar and lecturer at the Center for Intercultural Studies and Education, Josai University, Saitama, Japan (1991). Marj was also awarded distinguished chairs and fellowship grants, including the Henry Lee Irwin Chair in Writing by the Ateneo de Manila University in Quezon City (1989-1990); Regional Fellowship for Poetry and Writing Workshop Fellowship by the University of the Philippines (UP) Creative Writing Center and UP National Writers' Workshop in Diliman, Quezon City (1986-1987 and 1978, respectively); and graduate fellowship and National Writers' Workshop fellowship by Silliman University in Dumaguete City (1977-1978, 1976 and 1981, respectively). She was also visiting professor at the University San Carlos Graduate School in Cebu City (Summer 1993).

Marj was also feted with the following awards: the City of Mandaluyong Ulirang Mandaleño Award for Literature (2012), the Province of Bohol Carlos P. Garcia Award for Outstanding Lifetime Contribution to Literature and Culture (2011), the City of Manila



FEATURED RESEARCHER

Patnubay ng Sining at Kalinangan Award for Literature (2005), and the Silliman University Outstanding Sillimanian Alumna Award for Creative Writing (2008).

DLSU named her writer-in-residence at the Bienvenido N. Santos Creative Writing Center, College of Liberal Arts (2011-2012 and 2012-2013), and conferred on her the Tranquilino Valderrama Chair in the Humanities (2009-2010), the Natividad Fajardo Professorial Chair in Literature (2008-2009), and the Julia Vargas Distinguished Professorial Chair in Philippine Literature (2000-2001). She was also a recipient of the St. Miguel Febres de Cordero Research and Publication Award for “ANI: The Life and Art of Hermogena Borja Lungay, Boholano Painter” (2007); Research Faculty Grants (2003-2004 and 1998-1999); and a Baldwin Professorial Chair for Writing Fellows (1989-1990).

A much sought-after and highly respected teacher, Marj also received the prestigious Metrobank Foundation’s Exemplar Made of Gold on the occasion of its 50th anniversary (2013), Award for Continuing Excellence (2004), and Outstanding Teacher-Tertiary Level National Capital Region (1999). She was also named outstanding graduate thesis mentor of the College of Liberal Arts (2010-2011).

Since joining DLSU in May 1983, Marj has held various administrative positions in the University where she was full professor at its Department of Literature. She describes the work rhythm in the following administrative posts as “very different from the rhythm of putting a poem into its full form,” which include serving as director of the DLSU Research Center Research Dissemination Office (1985-1987), director of the DLSU Press, Inc. (1987-1990), chair of the Literature Department (1993-1994), and director of the Bienvenido N. Santos Creative Writing Center (May 2001-2004). She was editor of *Ideya* Journal of the Humanities, published by the College of Liberal Arts, De La Salle University, Manila (2001-2004).

In 2004, she was conferred the title of Honorary Fellow of the University, the highest award and distinction given by DLSU to a faculty, in recognition of her consistent pursuit of scholarly research and publication, effective teaching, and exemplary modeling of Christian and Lasallian values.

Marj has consistently published in reputable print and online anthologies/periodicals. Her poems in English have been translated into Cebuano-Visayan, Filipino, German, Japanese, Chinese, Kannada (South India), Vietnamese, and Romanian. Her most recent publications include: “In the Desert” and “It’s Time to Come Home,” in *Cha: An Asian Literary Journal* (2013); “Last Things,” in *Axon: Creative Explorations: contemporary creativity, poetry, images and design* (2013); “Acquainted with Lightning,” in *Prairie Schooner: Stories, Poems, Essays, and Reviews since 1926* (2013); *Painting the Invisible: Poetry in Galeria Paloma: Two* (2013); “Pag-alindasay sa Septiyembre” translated by Coy Ponte in *Bisaya Isip 7 Tuig 84* (2013); “Despedida,” in *The World Record: International voices from Southbank Centre’s Poetry Parnassus* (2012); “Birds of Paradise,” “For Maria Kodama’s Other Borges,” and “Sagada Stills in a Floating World,” in *Cordite Poetry Review* (2012); In Baclayon reading Levortov,” in *Under the Storm* (2011); “Tertulias at San Jose and a Family Album” in *The Dumaguete We Know* (2011); “Solsequiem,” “In Baclayon,” “Solsequiem” in *Asiatic Journal’s special issue on Southeast Asian Literature* (2011); “Origami” and two other poems translated into Estonian by Juri Talvet in *Akadeemia Journal* (2011); “Kunstskammer” in *Caratula* (2011); “Es este el Martin Pescador?” and other poems in *Amnios 2: Revista Poesia Internacional de La Habana* (2010); “Solving for X” in *La Otra* (2010); “Solsequiem” in *Prowess & Grace: A festschrift for Edna Zapanta Manlapaz* (2010); and “Despedida” in *The Other/ Other: Festschrift in honor of Isagani Cruz* (2010).

Very visible in her professional circle, she would either keynote or serve as a resource person in various professional gatherings, such as “Learning the lesson of meaningful silence (A Buddhist aesthetic in the praxis of poetry)” a Dharma Sunday Buddhist Lecture (Mabuhay Temple, March, 2014); “Dire Warnings: Philippine Women Writing Beyond Hopelessness,” (Keynote presentation, Women’s Writing in Asia at the University of Lingnan, Hong Kong, March 2014); “Memoir of a writing life: learning the lesson of meaningful silence” (University Fellowship Lecture, DLSU, March 2014); “Is it the Kingfisher? (part of the BBC 3 Words and music Program, “Blue” Episode, January 2014); and “The Art of Poetry & Healing” (Mabuhay Buddhist Temple, January 2013). Marj also remains an active member of prestigious professional organizations including: P.E.N. Philippines, Philippine Literary Arts Council, Creative Writing Foundation, Inc., International Council of Museums, Network of Outstanding Teachers and Educators, and honorary lifetime member of UMPIL (Writers Union of the Philippines). She serves as board member of the Women’s Feature Service and the Gracia Balbon Foundation. She was a founding member of Women Involved in Creating Cultural Alternatives (WICCA) and Women in Literary Arts (WILA), two organizations that espouse the cause of women writers.

Marj enjoys meeting younger writers who want their work to be assessed seriously by seasoned poets who had spent at least 20 years ahead of them writing and publishing books. Thus, she makes time to direct and regularly sit as a member of the panel of readers in several writing workshops of the country to give budding young writers her insights that would help them revise their work. She credits icons Edith and Edilberto Tiempo, who taught her that revision is an important part of craft and takes the most time. Among these workshops she either directs or regularly sits as a panelist are: the annual IYAS Western Visayas Writing Workshop held in Bacolod City; the National Writers Workshop in Dumaguete City; Cornelio Faigao Writers Workshop in Cebu City; Ateneo *Heights* National Writers Workshop in Quezon City; De La Salle Lipa Writers Workshop in Lipa City; and University of San Agustin, Iloilo City. Related to the foregoing, Marj had also served as a member of the board of judges in various national writing competitions, such as: the National Book Awards, Carlos Palanca Literary Contests, National Commission for Culture and the Arts Writer’s Prize, NBDB Writers’ Grant, Ubod first-book awards, Madrigal-Gonzalez First Book Awards of University of the Philippines-Likhaan Institute of Creative Writing, Philippines Free Press Annual Poetry awards, Maningning Miclat Foundation Poetry Awards, and the Carlos Garcia Literary Awards.

She graduated *Magna cum laude* from Divine Word College in her hometown with a degree of Bachelor of Arts major in English. Thereafter, she worked as a media specialist for the Ministry of Public Information Region 8 in Tagbilaran City (1974-1979). She later became an Instructor at Silliman University, Dumaguete City (1982-1983) where she pursued and completed her Master of Arts in English (Creative Writing) (1982). She earned her Ph.D. in Literature *With Distinction* from DLSU (1998).

Marj retired from full-time teaching in DLSU in January 2014, after 31 years of service. She now devotes her period of restoration (her own term for what others call “retirement”) traveling, teaching and doing research in the Visayas and Mindanao; doing community engagement; and writing poetry. Her ongoing book projects/research include a collection of new poems, namely: “It is Time to Come Home,” an anthology of memoir on growing up Boholano called “The Bohol We Love” and “The Confrontations of Evasiones,” a critical study of the groundbreaking feminist poems of Dominican Republic Poet, Chiqui Vicioso.

LOCAL GOVERNMENT CAPACITY AND COOPERATION IN DISASTER RISK REDUCTION AND CLIMATE CHANGE ADAPTATION

Dr. Francisco A. Magno ■ Dr. Alvin B. Culaba ■ Dr. Ma Divina Gracia Z. Roldan ■ Dr. Sherwin E. Ona ■ Mr. Ian Jayson R. Hecita

Introduction

In 2013, the Jesse M. Robredo Institute of Governance (JRIG), with the support of the Commission on Higher Education Philippine Higher Education Network (CHEDPHERNet), implemented the Local Government Capacity and Cooperation in Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRRM), an action-research project.

The project generated knowledge to support the crafting of capacity development programs for local government units (LGUs) in Disaster Risk Reduction and Management and Climate Change Adaptation. It specifically explored and identified opportunities and challenges for inter-local government cooperation in DRRM and CCA programs and projects.

The project also assessed the incentives and capacity constraints that confronted LGUs in developing DRRM plans and CCA plans. The project team identified the local planning tools used by LGUs in linking DRRM and sustainable development strategies into local policies. In addition, it explored the role of inter-local government cooperation and collaborative



The **Jesse M. Robredo Institute of Governance (JRIG)** is a research and training institute of De La Salle University. It undertakes programs, projects, and activities that are effective in creating knowledge products, developing the capacity of stakeholders, strengthening university-community engagements, and fostering integrity, inclusiveness, innovation, and information-driven governance.

Established in 2001, the institute was originally called the La Salle Institute of Governance. It was renamed in October 2012 in honor of the late Interior and Local Government Secretary Jesse M. Robredo. The JRIG is a member of the Board of Directors of the Local Governance Training and Research Institutes Philippine Network. It serves as the Philippine secretariat of the International Academy of Chief Information Officers and is a member of the Association of Public Administration Schools of the Philippines. The Institute is also a member of the Transparency and Accountability Network, the Multi-Sector Governance Coalition of the Bureau of Internal Revenue, and the Governance Commission of Government Owned and Controlled Corporations. It likewise sits in the Steering Committee of the Open Government Partnership.



The research team conducting a focus group discussion with the Mayor and LGU officials of Mina, Iloilo (left); an interview with a local DRRM officer in Zarraga, Iloilo

governance in strengthening the capacity of LGUs for local DRRM and CCA.

Implemented in the province of Iloilo, the action research was a 12-month project. It was actually part of a bigger three-year program. By 2015, the study was expected to focus on LGU capacity and cooperation in climate change adaptation and disaster risk management in Bulacan. In its terminal year, a case study will be conducted in a province in Misamis Oriental.

Background of the Study

Good local governance includes sound local planning, proper implementation of land use policy, appropriate protection and management of ecosystems, local capacity building, inter-local government cooperation, and empowerment of rural and vulnerable livelihoods and communities. It can greatly help in reducing the risk of disasters making cities and communities a lot safer. Inter-local government cooperation may be described as an arrangement where LGUs that are geographically adjacent and contiguous to each other enter into an agreement that will

allow them to share the benefits and the costs of delivering goods and public services and to undertake inter-jurisdictional activities, programs, projects, and plans.

The United Nations International Strategy for Disaster Risk Reduction (UNISDR) 2005-2015 Hyogo Framework of Action (HFA) recognizes the important role that LGUs play in achieving disaster risk reduction and building resilient communities. In the Philippines, LGUs are the frontliners in implementing preventive measures and in addressing the adverse effects of disaster risks and climate change. By virtue of Republic Act (RA) No. 10121, otherwise known as the DRRM Law of 2010, and RA No. 9729 of 2009, also known as the Climate Change Law, LGUs are mandated to develop Local Disaster Risk Reduction and Management Plans (LDRRMPs) and Local Climate Change Action Plans (LCCAPs). Provinces, cities, and municipalities are required to form and finance their respective local DRRM offices (LDRRMOs) that will be tasked to implement the said plans.

Rationale

The aftermath of typhoons Sendong, Pablo, and Yolanda has revealed that the country's LGUs still lack the capability and resources to

fulfill their mandate relative to DRRM and CCA. They are faced with technical and fiscal gaps that prevent them from addressing disaster risks. Moreover, they experience problems regarding inter-governmental coordination and the collaboration between LGUs and national government agencies pertinent to disaster risk reduction planning, response, and rehabilitation.

A possible way to address the problems is to forge inter-local cooperation. However, there is little information on how such alliances can be used to build the capacity of LGUs for DRRM and local CCA planning.

Project Goal and Objectives

The broad goal of this collaborative action research was to contribute to the improvement of Philippine DRRM and CCA through local capacity building and inter-local government collaboration. The project team specifically endeavored to a) generate knowledge on DRRM and CCA capacity needs of LGUs, particularly

in planning; b) identify opportunities and challenges for inter-local government cooperation in DRRM and CCA programs and projects; and c) provide inputs in developing capacity-building programs on inter-LGU DRRM and CCA.

Scope of Data Gathering

The JRIG surveyed LDRRMO and municipal/city planning and development officers (MPDOs/CPDOs) of 42 municipalities and one component city in the province of Iloilo. LGUs in the province of Iloilo were purposively selected to serve as survey sites on the basis of the current scope and extent of inter-LGU collaboration in their respective areas.

Key informant interviews were conducted with selected local chief executives (LCEs), heads of national government agencies in the province, and representatives of civil society organizations (CSOs) and local higher education institutions. A focus group discussion was organized in two municipalities.



Dr. Francisco Magno, Director of the JRIG speaking at the National Conference on Inter LGU Collaboration and Disaster Risk Reduction in Iloilo



Conclusions and Recommendations

Sound planning was viewed as dependent on the systematic collection of data from the community, specifically from the areas which were affected by disasters in the past. Data gathering (which included valuable inputs from the community and local residents), knowledge, and information management were seen as the most crucial areas where LGUs needed capacity building. The LGUs could integrate these into their local DRRM and CCA plans. In particular, problem identification and analysis were recognized as the most important areas where LGUs had to be trained.

Capacity gaps

Despite the several laws that mandate them to craft DRRM and CCA plans, the LGUs are not able to do so, owing to ‘capacity gaps’. These capacity gaps include their lack of expertise and deficient financial resources to supplement the DRRM budget. The latter inevitably result in inadequate resources to procure equipment and set up the necessary facilities.

With its setup, the LDRRMO has no full time personnel in charge. The LDRRMO is usually headed by the Local Agricultural Officer, the Local Development Planning Officer, or the Local Environmental Officer. It does not have a full time salaried staff to manage the office.



Director Roselyn Quintana, DILG Region 6, Local Government Capacity Development Division, and Mr. Jerry Bionat, Provincial DRRMO, Iloilo

Existing LDRRMOs have also expressed the need to improve their capacity and skills for resource generation, data gathering, knowledge management, partnership with universities, and local weather forecasting. The crafting and the submission of an LDRRMP and an LCCAP are seen as mandatory requirements rather than as substantive activities of the LGU. Owing to this viewpoint, some LGUs simply copied the plans of other LGUs. In most, if not all, cases, these plans do not take into consideration the needs of the former's localities and constituents.

Current LGU Programs and Policies

Although LGUs are not able to comply with the mandated DRRM and CCA plans, they have programs and policies that are related to climate change adaptation. These programs and policies include recycling, solid waste management, environmental education, ecosystems protection, and plastic-use ban. Moreover, CCA policies, programs, and projects are usually lodged in the Municipal Environmental Office, the Municipal Sanitation Office, or the Municipal Planning and Development Office.

Existing LGU Collaborations

There are no formal inter-LGU or inter-local alliances that directly address DRRM, but there are several collaborations on climate change-related issues and problems. The informal

inter-LGU alliances that exist at the provincial level are mostly focused on economic development, health care service delivery, watershed and river management, coastal resource management, and environmental governance.

Obstacles to Initiating and Sustaining Inter-LGU Arrangements

There are factors that deter LGUs from entering long-term agreements. These are changes in local leadership, local party configuration, and political dynamics due to the three-year electoral cycle and lack of support from the local councils. Essentially, the sustainability of cooperative arrangements is very much contingent on LGU leadership. This leadership can make an alliance continue or not.

Need for participation from the academe and the civil society in local DRRM and CCA initiatives.

Data collection is an area where those involved in disaster risk reduction and climate change initiatives need capability building. The project team saw the need to link knowledge producers and knowledge consumers in DRRM and CCA. It also noted the lack of participation of stakeholders, such as local higher education institutions, in local DRRM planning and program implementation.

ePARTICIPATION: DEVELOPING WEB-BASED LEGISLATIVE INTELLIGENCE SYSTEM FOR THE PHILIPPINE SENATE

Dr. Rachel Edita O. Roxas ■ Ms. Charibeth K. Cheng ■ Dr. Sherwin E. Ona ■ Mr. Allan B. Borra

Introduction

Information and communications technology (ICT), a general-purpose technology, fuels the current information revolution. In recent decades, the view of ICT has evolved from transactional (e.g., automation) to transformational.¹ According to the latter view, ICT is an ‘enabling tool’ that opens the potentials for growth through the integration and transformation of products and services² not only in business and economics but also in governance, particularly toward encouraging political participation. It is this transformational view that is at the heart of the discourse of the current techno-economic paradigm shift.

Recent initiatives in the Philippines toward socio-political reform reflect the effort of government to enable citizen and LGU participation in the process of governance. The empowerment of citizens and other stakeholders through eParticipation (electronic participation) has been implemented through administrative and resource control of the



Formerly called the Advanced Research Institute for Computing, which was established in 1994, the **Advanced Research Institute for Informatics, Computing and Networking (AdRIC)** is the research unit of the College of Computer Studies. Its mandate is to pursue the research ideals of the College. These ideals are the setting of the directions and priorities of research activities undertaken in the various fields of computing, the encouragement of research and development projects consistent with identified thrusts and priorities of the University, and the pursuance of collaborative ventures with partners in industry, government, and academe in the service of society through research.

local governments and through legislation. The legislative measures include Republic Act (RA) 7160, more popularly known as An Act Providing for a Local Government Code of 1991; RA 8425, known as the Social Reform and Poverty Alleviation Law; and RA 8792, the e-Commerce Law of 2000 that has mandated government agencies to make government services available online to citizens.

The laws have given the local government units (LGUs) the new responsibility for ensuring participation of their constituent communities in the process of governance. These units now have the legal mandate to move toward eParticipation or to enable the active participation of stakeholders (citizens) in the process of governance using ICT.

The project team recognized that crucial to the eParticipation process was the ability to source the right information/knowledge and route this to the potential users. The team, therefore, conceptualized this project—which entails the use of the Internet as a 24/7 tool—and some established document management (DM) and innovative natural language processing (NLP) or language technology techniques to ensure an integrated approach to democratic participation in policy-making. Through transparency and pushing important relevant information through texts and languages recognized by the computer, citizens can be empowered by making them aware of and involved in issues that particularly affect them. The participation of empowered citizens is beneficial to achieving good government and governance as well as in crafting pertinent policies.

The eParticipation Portal

The project team developed an eParticipation portal using ICT as a viable medium for eGovernment and eParticipation.

Electronic government, or eGovernment, entails ‘pushing’ (disseminating) information to the stakeholders (LGUs and their constituent communities), who are the recipients/beneficiaries of products/services. eParticipation refers to the stakeholders’ opinions and comments posted online on forum sites and the interaction of these stakeholders with government personnel and other citizens/netizens.

eParticipation needs top-down (legislature to citizens) and bottom-up (citizens to legislature) involvement. The interplay is vital in sustaining the whole eParticipation network.

The eParticipation portal was developed in collaboration with the Philippine Senate’s Blue Ribbon Oversight Office Management (BROOM), headed by Director General Atty. Rodolfo Quimbo. The daunting task of evaluating opinions on the organization’s performance was done by Dr. Shirley Lua, a linguist and faculty member of the DLSU Literature Department.

The entire project was implemented under the auspices of the PANeGov program, which is managed by IdeaCorp, headed by Executive Director Emmanuel C. Lallana, and funded by the International Development Research Centre, Canada.

The Project Scope

The study focused on the use of ICT in the Philippine legislative process. The ICT solutions that were applied to the legislative process specifically focused on a) the retrieval/extraction of relevant information (pull); b) the routing of information (push) to intended recipients; and c) the storage of information. The study integrated both top-down and bottom-up approaches in the development of the framework.

The project augmented the DM system, which is the application for retrieving, tracking electronic documents and/or images, and

storing, using NLP that allows for automatic organization of data obfuscated in texts found in documents. NLP facilitates the search for and the retrieval of documents as well as the storage of information found in the volumes of documents in the DM system.

An NLP application called ‘information extraction’ (IE) was used in this project. IE acquires and analyzes data from unstructured texts and transforms them into structured information. Unstructured texts refer to documents with varying formats, composition and writing styles, points of view, and varying topics – e.g., raw data or texts from emails, web pages, newsgroups and forum postings, news articles, research papers, business reports, and other forms involving human (as opposed to computer) texts. Structured information, on the other hand, includes the identified relevant ‘entities’ in the texts, such as people, organizations, places, dates, monetary amounts, and figures. It involves establishing relationships between and among these entities.

The forums feature of the eParticipation system enables e-citizens to contribute and express their views on the subject at hand. The project team also made use of the ‘automatic opinion clustering or classification’ feature of NLP to automatically sort and group inputs from the eParticipation forums.

Pilot-testing

The study was pilot-tested by the Blue Ribbon Committee (BRC), a regular working group of the Philippine Senate that is also known as the Committee on Accountability of Public Offices and Investigations. The BRC has jurisdiction over all matters, including investigations, relating to the wrongful conduct of officers and employees of the government, its branches, agencies, subdivisions, and instrumentalities, as well as their failure to discharge their public duties. It is also concerned with the implementation of the provisions of existing laws and statutes

on nepotism. It is empowered to conduct investigations in aid of legislation on any matter of public interest.

The BRC allows concerned citizens and civil society groups to file position papers on current legislative issues. Notably, public hearings by way of committee proceedings that tackle highly controversial issues are aired on television.

One of the challenges confronting the BRC is the difficult task of processing electronically submitted information. As the number of electronic submissions increase, the traditional solutions are to hire additional manpower to process them and to require structured inputs from stakeholders to facilitate information processing.

At the time of the study, the BRC, specifically the Blue Ribbon Oversight Office Management (BROOM), had no electronic DM system infrastructure. Only one of the staff was knowledgeable about and handled the BROOM’s document filing, cataloguing, and retrieval procedures, and this employee was scheduled to retire soon. These conditions thus posed a limit to the opportunity for stakeholders to actually express their views about issues that were handled by the BRC. To address the problem, the project team implemented a DM system (Figure 1) before undertaking information extraction research. The architecture was customized to accommodate the documents available in the BROOM.

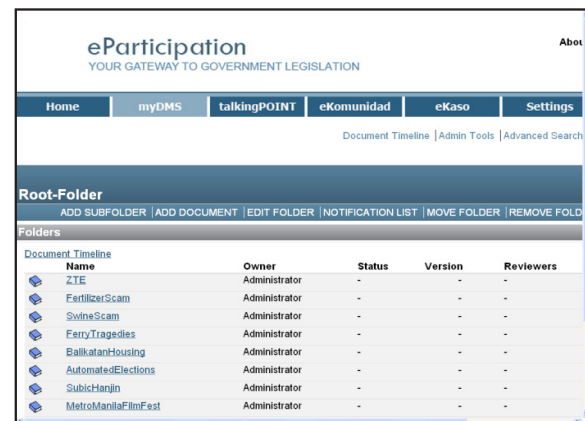


Figure 1. Document Management System

Project Implementation and management

A functional prototype was designed and developed using programming and database management platforms guided by a continuous verification of stakeholder requirements. A system quality assurance group was formed for internal quality control for the system capabilities and documents. Regular validation of the prototype was conducted with the Senate Management Information System (MIS) and the BRC staff.

The web portal shown in Figure 1 serves as a venue for information dissemination. It holds together the components of the eParticipation portal: the document management system (myDMS), which tracks and stores electronic documents related to the ongoing cases under the BRC; the case management system (eKaso or eCase) that addresses the problems of data handling and updates the retrieval and processing of complaints filed with the BRC; and the forums (talkingPoint, and eKomunidad or eCommunity) where citizens can express their views and opinions.

The eKaso also addresses the top-down component of the portal by 'pushing' information from the BRC to the concerned citizens. On the other hand, talkingPoint, a web-based opinion detection and classification system developed and aptly named VoxPop, is the bottom-up component of the portal. It allows the citizens to express their opinions regarding topics being discussed and managed by moderators. The eParticipation portal's information extraction engine allows uploaded documents to be readily searchable and retrievable.

Conclusions, Realizations, and Recommendations

The project team realized that eParticipation was not only an application; it had to be treated as an organizational-social phenomenon composed of several factors, mechanisms, agents, and dimensions.



Figure 2. eParticipation Portal

eParticipation in the Philippine Senate would therefore be an “ecosystem” of factors.

The BROOM expressed willingness to own and host the eParticipation system through the MIS, but because of organizational constraints, it requested for the removal of the ‘forums’ and ‘information extraction’ engine, and to make accessible only the myDMS and the eKaso.

Contextualizing eParticipation to Philippine Setting

Available literature on eParticipation focuses on the European and the US experiences. Although they are useful references, the project team recognized the need to “contextualize” or adapt these foreign models to the Philippine setting. The team also feels that adopting a socio-technological perspective in the use of ICT to enhance participation of stakeholders is also important. It would augur well for eParticipation studies to treat knowledge-information as valuable resources for good governance, where ICT is an enabling tool, and for which project sustainability is an important consideration.

Preparing or Creating Institutions

The two main initiators of eParticipation are the government (for the top-down consultation), and the non-government agencies (for the bottom-up approach). In order for eParticipation systems to work, new structures/units in government agencies have to be formed. In the case of the Senate, the MIS is seen as having the capability to manage the eParticipation system. However, the responsibility of the MIS is limited to the electronic data processing needs of the Senate. There is, therefore, a need for new institutions/structures/policies to address the technology-driven initiatives of the government.

The project team believes that structural adjustments and policy formulation can provide solid bases for eParticipation in the

Philippine Senate – or any government agency for that matter – that would decide to host an eParticipation system. Thus, sponsorship remains a crucial factor in ensuring the sustainability of eParticipation in the Senate because the ICT and the good governance agenda are mutually inclusive.

Bridging the Human Capacity Gap

The readiness or openness of the host institution to adapt an “eParticipation culture” by accommodating online tools to promote participation is important. In the case of the BROOM, willingness was evident, but it was, as mentioned, constrained by organizational considerations. Training of stakeholders and users is a must for eParticipation in the Senate. Other issues such as privacy and identity concerns also need to be addressed.

Using New and Appropriate ICT Tools

Consistent with the search for an appropriate eParticipation model is the choice of suitable ICT tools that can support it. Short Messaging Service (SMS), of which Filipinos are known to be active users, has been considered a convenient tool of choice for eParticipation. However, while citizens can be easily encouraged to participate using this ICT tool, an important challenge to the BROOM is the processing of the messages received. Relative to this, the project team also explored the applicability of other Web models such as version 3.0 alongside the use of mobile technologies.

The foregoing findings seem to point to an ongoing evolution of participatory practices in government, specifically in the BROOM. The possible hindrance to participation can result from weighing traditional functions vs. new opportunities, the reluctance of the potential host to fully adopt the eParticipation system (due to lack of expertise to administer, maintain, and sustain it, among other things),

and the need to develop a new perspective on eParticipation.

The participation of civil society groups and the private sector is important for credibility and relevance of eParticipation. The need for a strategic communication plan that will encourage stakeholders to use the eParticipation system was also noted by the project team. The team documented the issues relating to the development of an eParticipation framework adapted to the Philippine setting. It reiterated the inadequacy of adopting a technocentric perspective and adhered to the idea

that eParticipation had to be viewed as a social-organizational phenomenon, consistent with the concept of eTransformation which looks at the transformational effect of ICT in the various aspects of organization and the individual.

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CONTINUOUS-TIME OPTIMIZATION MODEL FOR SOURCE-SINK MATCHING IN CARBON CAPTURE AND STORAGE SYSTEMS

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Introduction

Climate change caused by emissions of greenhouse gases, particularly carbon dioxide (CO_2), is considered the most critical environmental issue confronting the world today. Carbon dioxide emissions from combustion processes in energy systems are major contributors to the problem, owing to the strong link between energy use and economic development. Recent decades have witnessed the efforts of economic planners, environmental engineers, operations researchers, and geologists, among others, to explore strategies that could help arrest the serious effects of climate change on this planet. Included among these strategies are energy management schemes such as energy efficiency enhancement, fuel substitution (e.g., biomass cofiring), the use of non-combustion technologies (e.g., solar, wind, or nuclear energy), and the use of carbon capture and storage (CCS).

CCS is the process of capturing pure CO_2 from gaseous combustion products of industrial sites that act as “sources” and storing this in naturally occurring underground



The **Center for Engineering and Sustainable Development Research (CESDR)** is the research arm of the Gokongwei College of Engineering (GCOE). Established in 2003, the CESDR is mandated to promote, catalyze, and crystallize scientific activities in engineering sciences and technology. These activities could help the country to achieve strategic advances in complex engineering systems and firm-level technologies necessary for the sustainable development of the country. The CESDR is envisioned to become the Center of Excellence in Engineering Research and Technology Innovations.

The Center aims to make significant contributions to the growing scientific knowledge in engineering and technology. It has engaged in experimental research and modeling of industrial systems and technologies, and it has facilitated the effective transfer of these technologies from the academic research community to industry and society in the pursuit of sustainable development. The Center has also tapped expertise from different fields of engineering and the social sciences in the development of scientifically rigorous, systems-oriented technological solutions to emerging complex and multidimensional challenges that are associated with contemporary environmental problems and issues.

reservoirs that act as “sinks”. It is a process of redirecting the CO₂ emission that would normally go into the atmosphere into subterranean reservoirs or sinks. Sinks may be porous geological structures that have impermeable cap rocks that accord them the ability to permanently contain and seal off CO₂ to prevent it from leaking into the atmosphere. These sinks are typically situated several kilometers below the ground surface.

CCS is considered unique among the energy management schemes earlier mentioned in that it potentially allows the continued use of fossil fuels like coal, oil, and natural gas that result in CO₂ emission levels that are dramatically lower than those of conventional fossil-fired systems.

For CCS to work, geologists need to locate and characterize naturally occurring geological reservoirs to determine if they can serve as sinks for CO₂. In particular, they need to determine the size (i.e., storage capacity) and integrity (e.g., low seismic risk) of potential sites. These reservoirs may be in the form of inaccessible coal seams, saline aquifers, depleted oil wells, and other geological

reservoirs. What will make these reservoirs particularly useful for CCS is their capacity and ability to seal off the CO₂.

Systematic approaches, which include mathematical programming¹, have been developed to plan for CCS deployment while accounting for energy penalties. Energy penalty for CCS is the amount of extra fuel that must be used for CCS operations. It can either be an “additional [amount of] fuel required to maintain a power plant’s output or the loss of output for a constant fuel input.”²

Turk et al.³ proposed an earlier model for allocating CO₂ to depleting wells for enhanced oil recovery (EOR) operations (Figure 1). Through subterranean injection, the CO₂ pushes the oil upward to enable it to be channeled to the production well. Over time, these oil wells become completely empty of oil and can thus become sinks or reservoirs for CCS.

Several mathematical models have been developed to more or less match the amount of CO₂ produced into the atmosphere, the capacity of a potential reservoir, and the amount of time it would take to fill the reservoir to full

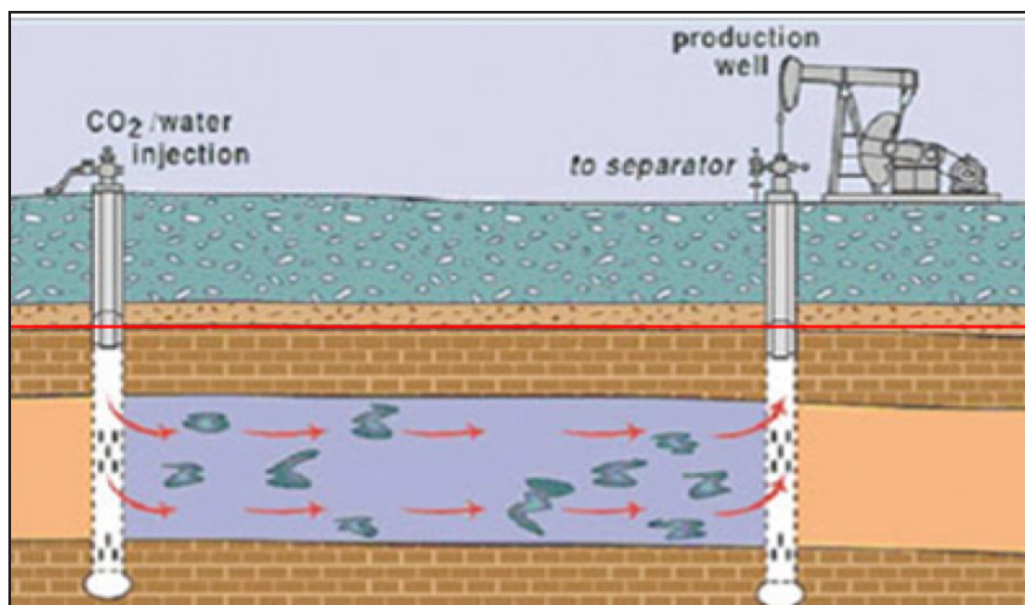


Figure 1. Enhanced Oil Recovery (EOR) Operation

capacity with CO₂. The latter variable is crucial and is used side by side with the life of the CO₂ source – i.e., power plant or manufacturing plant. One model is the SimcCCS⁴ which uses a mixed integer linear programming (MILP) formulation that incorporates decisions about infrastructure characteristics such as pipeline size. However, this model assumes that all

sources and sinks are present simultaneously, which is far from reality.

A commercial example of large-scale CCS application is Sleipner, which began in 1996 in Norway. It is located in the North Sea and involves the removal of CO₂ from natural gas and its subsequent disposal in a deep saline aquifer.

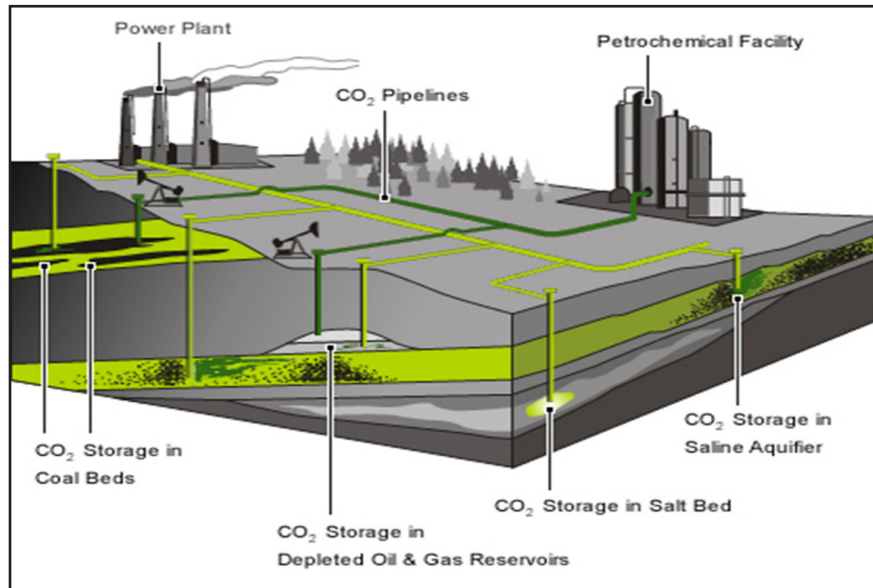


Figure 2. Sample Carbon Capture and Storage (CCS) Scheme



Figure 3. The prototype developed by the research team

The Mixed Integer Linear Programming Model (MILP) for matching CO₂ sources and sinks

With Grant No. 04 RPW AY11-12 administered by the University Research Coordination Office, an international team of researchers developed a computer-aided planning tool. The team – from the Indian Institute of Technology Bombay in India, the University of Nottingham in Malaysia, and DLSU in the Philippines – developed a prototype computer model capable of matching CO₂ sources and sinks. Specifically, the model is able to determine at which point in the life of a source the CCS can be deployed. To do so, the model matches the amount of pure CO₂ that a given source or set of sources emits and the size of the sink or set of sinks where the CO₂ can be injected. This information is crucial in determining the best time when the CCS system can be retrofitted to the source so that the end-life of the source coincides with the saturation/satiation point of the sink.

The computer-aided mathematical model for matching CO₂ sources and sinks was formulated considering temporal and storage capacity constraints. The most significant physical consideration of the current study is the capacity of the CO₂ sinks.⁵ The model also accounts for CO₂ emission penalties that result from generating extra electricity to compensate for grid-wide CCS power losses.⁶ However, it does not explicitly account for the economic aspects of the CCS infrastructure investment because it is assumed that all sources and sinks in a given system are sufficiently close to each other to make all possible matches economically viable.

Significance of the Model

The researches emphasize the important role of the systematic planning process for CCS. The model they developed is intended to aid environmental planners in strategic planning of CCS deployment. Planners and decision makers have to initially agree on whether or not to capture CO₂. Assuming that they decide to capture CO₂, they will need to hire the services of a geologist or a team thereof to locate and characterize naturally occurring or man-made subterranean reservoirs that are within close proximity to the plant sources. Characterizing the potential sinks means determining their storage capacity and their ability to permanently seal off the CO₂. Once the sinks are assessed as viable storage for CO₂, the next step is to decide when the CCS can be deployed or at which point of the operating life of a plant source the CCS can be implemented. There is also a need to consider whether a plant should be enhanced or a new one should be built. The answers are crucial because the timing of deployment is dependent on the amount of CO₂ the sink can accommodate.

In case there are several plants competing for a limited number of potential sinks, the decision makers must determine how to connect them in such a way that the best results are achieved – which means that the optimum amount of CO₂ is captured. The prototype model was demonstrated using hypothetical but realistic case studies. The results of these studies are shown in Figures 4 and 5.

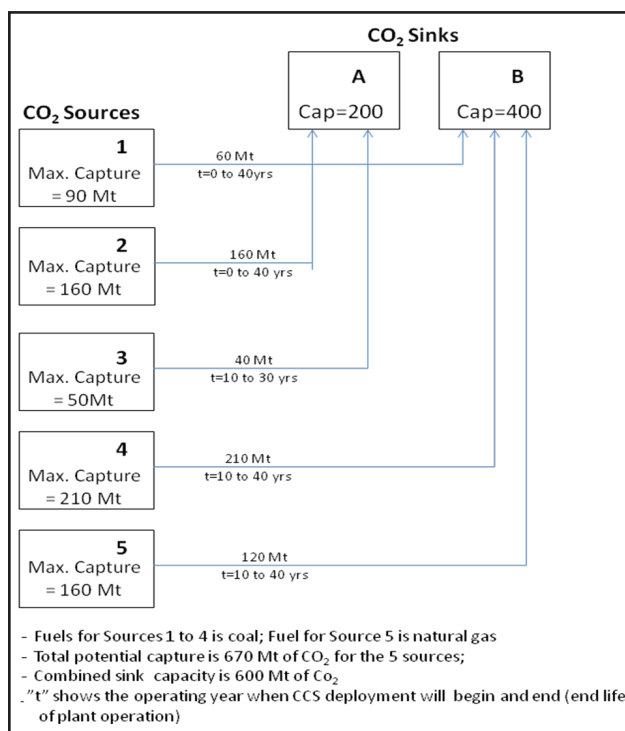


Figure 4. Schematic diagram of CO₂ network in Case Study 1 where t is the point of operating years when CCS will be deployed.

Conclusions

A computer-model was developed for CO₂ source-sink matching in CCS systems. The model particularly considered the CO₂ storage limitations of the sinks, as well as temporal issues that arise when the operating lives of CO₂ sources do not fully coincide. The research team developed an MILP formulation for which globally optimal solutions could be determined with no significant computational difficulties. The two illustrative case studies demonstrated the applicability of the proposed model, which did not explicitly include economic objectives as it was intended for preliminary planning of CCS in a given region or locale. Economic considerations were only implied through the assumptions that the various plants were located in close geographical proximity to prospective or potential storage sites and that a

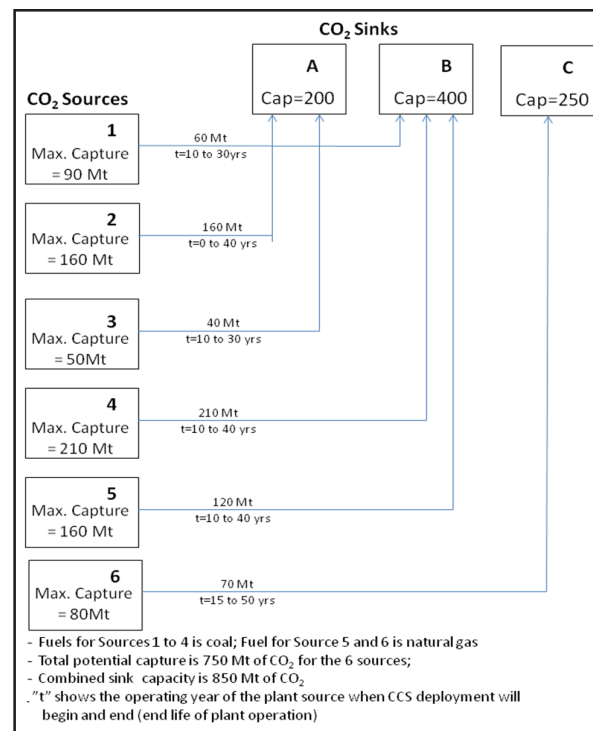


Figure 5. Schematic diagram of CO₂ network in Case Study 2 where t is the point of operating years when CCS will be deployed.

minimum viable duration of connectivity was specified for CCS to be viably efficient. Once optimal matches were determined based on temporal and physical considerations, a more detailed assessment of the CCS system flow could follow.

The research team recommends that future work focus on the development of extensions of the source-sink matching approach to incorporate other relevant planning considerations – such as demand for electricity, power cost, CO₂ emissions and injectivity limits, and pipeline size and pumping costs. In such dynamic models, decisions pertaining to the construction of new plants (or enhancement or extension of lives of existing ones) may be included.

Finally, detailed models that consider the relative geographic distribution of CO₂ sources and sinks may be developed and, in close proximity, may be grouped into clusters.

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DRAWING BEST PRACTICES OF COMMUNITY ADAPTATION TO CLIMATE CHANGE: IMPLICATIONS TO INSTITUTIONAL PROGRAM DEVELOPMENT

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Introduction

Among the priority strategies to reduce the impact of climate change are knowledge and capacity building. Both include knowledge of the science of climate change and the enhanced capacity for climate change adaptation, mitigation, and disaster risk reduction at the local and community levels. Cognizant of this, the project team undertook a collaborative research project funded by the National Research Council of the Philippines.

The study involved 759 participants who were selected using purposive sampling to avoid disrupting their normal schedules. The participants came from three different community groups: grade school students (n=330), high school students (n=308), and adult members of the locality—parents, school administrators, teachers, and local government officials (n=121). These participants lived in three different types of locales (rural, urban, and coastal) in the island of Luzon.

The researchers sought to determine the participants' concepts of climate change and looked into their attitudes toward the phenomenon. Essentially, the researchers wanted to know if their concepts were related



The **Lasallian Institute for Development and Educational Research (LIDER)** was established in 1993 under the College of Education (CED). Through LIDER, the College brings together the expertise of various educational professionals to serve the needs of the different sectors of the educational community. LIDER assumes the dual role of generating knowledge and helping solve the nation's developmental and educational problems. In that role, it responds to the growing demand for cooperative and multidisciplinary efforts to address these problems. In general, the LIDER aims to contribute to nation-building by conducting research studies, training educational leaders, and developing innovative strategies and culturally relevant educational materials. It also seeks to provide leadership in pushing the frontiers of education by offering varied and creative programs in different disciplines and initiates interdisciplinary research-based educational technology, human development, and formation programs. It also facilitates linkages with various end-users—policy makers, funding agencies, parents, teachers, students, community leaders, and researchers.

to their attitudes or their propensity to act in ways according to the adaptive measures taken by their community to address this environmental problem.

Results and Discussion

The results revealed that the student participants held only rudimentary concepts of global warming and climate change, and did not have a deep understanding of the phenomenon. High school students from the coastal communities registered the highest mean score while members of urban communities had the lowest mean score. The analysis of variance (ANOVA) showed a significant difference in the conception scores of participants among community groups and community types. Community practices on environment protection and climate change adaptation were clarified. Consequently,

implications relative to the development of a framework for an effective environmental literacy program for the community were drawn.

Concepts of Climate Change

The study initially focused on the prevailing concepts of climate change among the three community groups. Descriptive statistics were employed to determine the prevailing concepts of greenhouse effect, global warming, and climate change. A multiple-choice concept test was given to the participants. Ten items pertaining to greenhouse effect were included, and the respondents' total score was recorded.

Table 1 reveals that with regard to conceptions of greenhouse effect, the high school students and the adult community members from the coastal communities registered the highest mean scores of 4.38 and 3.46, respectively. They were followed by



Figure 1: The research team with the participants of the Focus Group Discussion conducted among the members of the LGU of Isabela, a rural community involved in the study.

Table 1 Comparing mean conception scores on climate change between community types and community groups			
Community Type	Community Group		
	Elementary Pupils	High School Students	Adult Community Members
	Greenhouse Effect (Number of Items = 10)		
Rural	2.68 (1.61)	2.92 (1.68)	2.45 (1.65)
Urban	3.41 (1.40)	2.84 (1.27)	2.62 (1.39)
Coastal	2.78 (1.42)	4.38 (1.59)	3.46 (1.21)
	Global Warming (Number of Items = 9)		
Rural	2.11 (1.38)	3.07 (1.60)	2.35 (1.53)
Urban	2.78 (1.35)	3.23 (1.48)	2.20 (1.56)
Coastal	3.07 (1.99)	3.01 (0.94)	2.92 (1.57)
	Climate Change (Number of Items = 6)		
Rural	1.12 (0.942)	1.81 (1.125)	1.67 (1.35)
Urban	1.43 (1.04)	2.10 (1.15)	0.75 (0.90)
Coastal	1.31 (1.02)	3.93 (1.64)	1.61 (1.16)

Note. N = 759, Standard Deviations in Parentheses

elementary pupils from the urban communities with a mean score of 3.41. The two lowest mean scores of 2.62 and 2.45 were registered by the adult community members from the urban and rural communities, respectively.

In terms of global warming concepts, the results also indicated that the three highest mean scores were those of the high school students from urban and rural communities and the elementary pupils from the coastal communities with 3.23, 3.07, and 3.07, respectively. The findings further reveal that in terms of climate change concepts, the high school students from the coastal community returned the highest mean score of 3.93, compared with the adult community members from urban locales, who returned the lowest mean score of 0.75.

To determine the significant difference in the conception scores, the researchers ran the ANOVA for each of these concepts, taken as dependent variables. The results of the ANOVA (Table 2) returned a $p < .05$ for all the

dependent variables, suggesting a significant difference in the conception scores among the community groups and the community types.

Prevailing Attitudes toward Climate Change

This study also examined the respondents' attitudes toward climate change. It specifically assessed the respondents' concern and sense of responsibility, along with their sense of optimism and commitment to lessen the impact of climate change. The results reveal that about 70% ($n=532$) of the respondents expressed concern for the effects of global warming in the Philippines. The participants also shared the belief that global warming was a serious problem, so much so that the perceived lack of response of some individuals to the issue of climate change bothered them.

In terms of optimism, about 53% ($n=401$) of the respondents manifested a neutral attitude, which could suggest that the respondents did not have sufficient understanding to be able to express optimism that the effects of climate

Table 2 One-way ANOVA of climate change conception among community groups and community types					
A. Community Group					
	df	SS	MS	F	P
Greenhouse Effect					
Between Groups	2	41.39	20.70	8.32	.000
Within Groups	756	1880.96	2.49		
Total	758	1922.36			
Global Warming					
Between Groups	2	23.12	11.56	4.94	.007
Within Groups	756	1770.07	2.34		
Total	758	1793.19			
Climate Change					
Between Groups	2	151.98	75.99	38.20	.000
Within Groups	756	1503.68	1.99		
Total	758	1655.66			

B. Community Type

	df	SS	MS	F	P
Greenhouse Effect					
Between Groups	2	91.47	45.74	18.88	.000
Within Groups	756	1830.89	2.42		
Total	758	1922.36			
Global Warming					
Between Groups	2	23.12	11.56	4.94	.007
Within Groups	756	1770.07	2.34		
Total	758	1793.19			
Climate Change					
Between Groups	2	151.98	75.99	38.20	.000
Within Groups	756	1503.68	1.99		
Total	758	1655.66			

change could be mitigated. It is noteworthy, however, that majority of the respondents still believed that the environmental problems associated with global warming could be solved.

The two other dimensions of climate change attitude are a sense of responsibility

and a firm commitment to help reduce the impact of climate change. Again, majority of the respondents showed a neutral attitude toward these dimensions. Data reveal that about 60% of the respondents (n=445) exhibited a neutral sense of responsibility, and about 50% (n=380) exhibited

Table 3	Comparison of mean attitude scores toward climate change between community types and community groups		
Community Group			
Community Type	Elementary Pupils	High School Students	Adult Community Members
Concern (Scale: 0-4)			
Rural	2.58 (0.65)	2.96 (0.59)	2.83 (0.39)
Urban	2.63 (0.63)	2.95 (0.46)	2.65 (0.58)
Coastal	2.56 (0.57)	2.87 (0.57)	2.46 (0.55)
Optimism (Scale: 0-4)			
Rural	2.18 (0.57)	2.58 (0.73)	2.53 (0.75)
Urban	2.41 (0.65)	2.84 (0.67)	2.30 (0.72)
Coastal	2.27 (0.60)	2.82 (0.79)	2.29 (0.51)
Responsibility (Scale: 0-4)			
Rural	2.11 (0.47)	2.65 (0.83)	2.35 (0.62)
Urban	2.25 (0.56)	2.80 (0.66)	2.30 (0.56)
Coastal	2.15 (0.54)	2.59 (0.57)	2.17 (0.52)
Commitment (Scale: 0-4)			
Rural	2.25 (0.62)	2.53 (0.64)	2.50 (0.64)
Urban	2.50 (0.67)	2.80 (0.63)	2.28 (0.64)
Coastal	2.37 (0.72)	2.67 (0.56)	2.41 (0.71)

Note. N = 759, Standard Deviations in Parentheses

commitment toward lessening the impact of climate change. ‘Sense of responsibility’ in the context of this study pertains to the belief that immediate action by all sectors of society is needed to slow down global warming. It also pertains to the conviction that the solution to this problem is not the sole responsibility of scientists and government leaders, or of big companies or developed countries. Every member of society has a role to play to help reduce the impact of climate change. This belief implies a commitment to take actions along with others to reduce the effect of the phenomenon, even if it entails sacrifice or giving up certain conveniences.

A similar study on the attitude of Europeans toward climate change reports that nearly two-thirds of Europeans (65%) do not

think that the seriousness of climate change has been exaggerated. They are, nevertheless, predominantly optimistic and widely disagree (60%) with the statement that ‘the process of climate change is unstoppable’ (EP-EC, 2008). The findings of the National Research Council of the Philippines (NRCP) study (Table 3) reveal that the urban community type and high school students exhibited the highest level of optimism, sense of responsibility, and commitment to take action toward climate change adaptation.

To further examine the respondents’ attitude towards climate change, the researchers compared the mean attitude ratings according to community type and community group using the ANOVA. The results (Table 4) show that between

Table 4 One-way ANOVA of climate change conception among community groups and community types					
A. Community Group					
	df	SS	MS	F	p
Concern					
Between Groups	2	19.00	9.50	28.86	.000
Within Groups	756	248.77	.33		
Total	758	267.77			
Optimism					
Between Groups	2	36.39	18.20	39.85	.000
Within Groups	756	345.24	.46		
Total	758	381.63			
Responsibility					
Between Groups	2	43.32	21.66	59.84	.000
Within Groups	756	273.68	.36		
Total	758	317.00			
Commitment					
Between Groups	2	15.41	7.70	18.18	.000
Within Groups	756	320.33	.42		
Total	758	335.74			

B. Community Type					
	df	SS	MS	F	p
Concern					
Between Groups	2	1.19	.597	1.69	.185
Within Groups	756	266.58	.35		
Total	758	267.77			
Optimism					
Between Groups	2	3.99	2.00	4.00	.019
Within Groups	756	377.64	.50		
Total	758	381.63			
Responsibility					
Between Groups	2	2.76	1.38	3.32	.037
Within Groups	756	314.24	.42		
Total	758	317.00			
Commitment					
Between Groups	2	4.18	2.09	4.77	.009
Within Groups	756	331.56	.44		
Total	758	335.74			

community groups, the difference in means in all aspects of their attitude towards climate change was statistically significant. However, when the mean scores were compared by community type, concern did not figure as statistically significant. This seems to suggest that rural, urban, and coastal communities exhibited the same degree of concern regarding the effects of climate change.

Relationship between Climate Change Conceptions and Attitudes

To explore any relationship among the constructs studied, the researchers employed a correlation analysis among conceptions of global warming, attitude towards climate change, and conceptions of climate change. From the correlation analysis, the following assertions were drawn:

- Understanding the greenhouse effect leads to an understanding of global warming and climate change and vice versa.
- Understanding of greenhouse effect likewise leads to a commitment to take action in order to reduce the impact of climate change.
- Understanding global warming and climate change does not elicit concern about the possible effects of climate change but is positively correlated with optimism, responsibility, and commitment.
- The belief about the occurrence of global warming is positively correlated with the beliefs that the problem was caused by human activities, and that it can harm both the environment and man.
- An attitude of concern about the effects of global warming leads to the optimistic view that its impact may be reduced.

- A sense of responsibility to take action leads to a commitment to help slow down the impact of climate change.

Framework for a Climate Change Literacy Program

Community practices were observed from the three community types. Generally, documentations were done through Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), a document review, a photo documentation, and site observations. The analysis of good community engagement practices was anchored upon the community engagement principles espoused by Riedy (2012). These principles state that the promotion of awareness of climate change must be embedded in all community engagement activities in a positive, inspiring, and fun approach (Riedy, 2012). Descriptions and comparisons of the three community types were drawn to develop a framework for a climate change literacy program. This framework focused on the types of knowledge, affective components, competencies, and behaviors associated with climate change literacy. The development of this framework was guided by the feedback loop of continued literacy development espoused by the North American Association for Environmental Education (Hollweg, Taylor, Bybee, & Marci, 2011). This framework defines an environmentally literate person as someone who, by himself and with others, makes informed decisions concerning the environment, acts on these decisions for the well-being of other individuals, societies, and the global environment, and participates in civic life. Improving climate change literacy does seek to prepare people to have better understanding and to train them to address challenges with workable evidence-based solutions (Hollweg, et al., 2011).

In this study, a person with a high level of climate change literacy possesses, at varying degrees, the following domains:

- knowledge about a wide range of climate change concepts, problems, and issues;
- a set of cognitive and affective dispositions;
- a set of cognitive skills and abilities;
- appropriate behavioral strategies.

These domains correspond with the four interrelated components of knowledge, dispositions, competencies, and environmentally responsible behavior in environmental education literature (Hollweg, K. S., Taylor, J. R., Bybee, R. W., Marci, 2011). The interactive structure of these domains is shown in Figure 2.

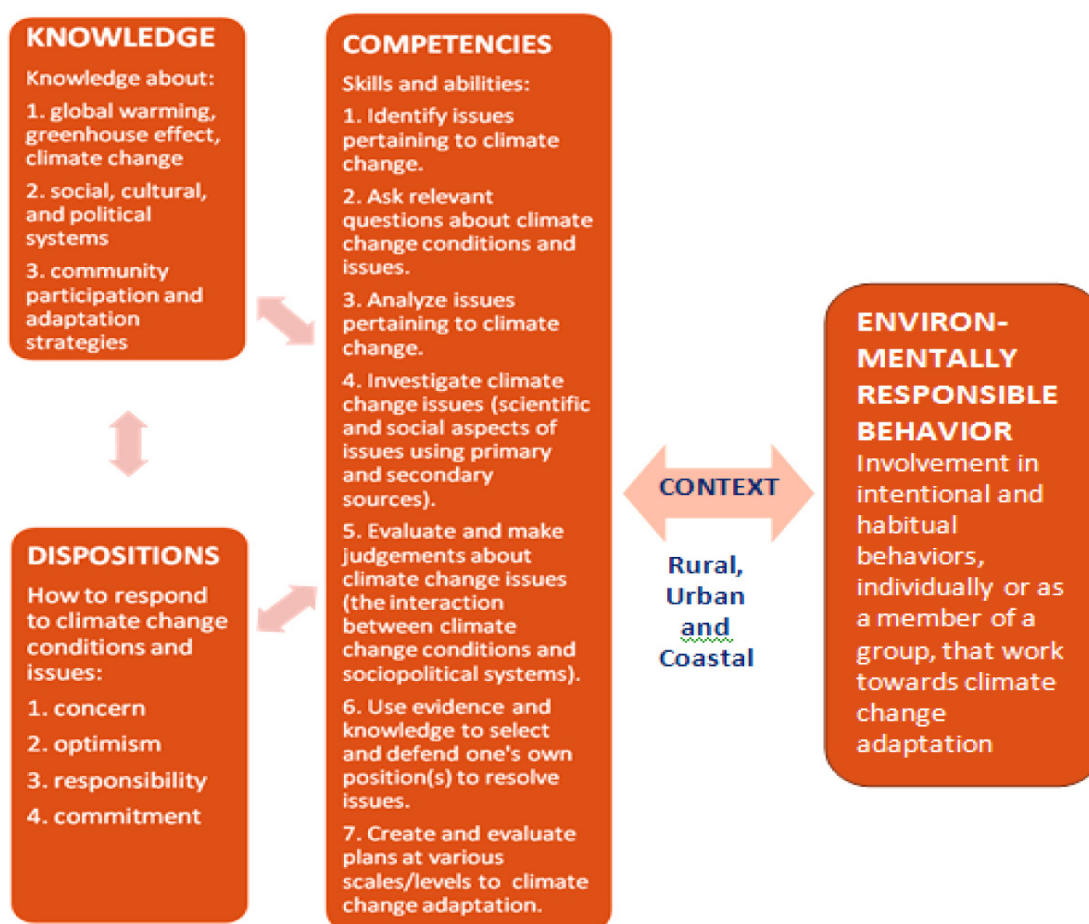


Figure 2. Framework for an Institutional Climate Change Literacy Program. It involves applying the feedback loop of continued literacy development espoused by Hollweg et al (2011) involving the four domains: (a) knowledge, (b) dispositions, (c) skills & competencies, and (d) environmentally responsible behavior.

Knowledge. This study deems it necessary for target stakeholders to have fundamental knowledge and understanding of climate change conditions and issues. As the study gathered, awareness of the issues and problems brought about by climate change was perceived by the respondents as the second most serious concern of the country. Further, the overall result of the climate change concept test showed that the respondents had a very low perception of concepts of climate change. This study also implies that majority of the respondents were aware of the occurrence of global warming and agreed that global warming brought about more negative than positive effects on the environment. This indicates that a more intensive strategy is needed to better inform and train the basic education learners about global warming, greenhouse effect, and climate change.

Dispositions. Dispositions refer to the cognitive and affective inclination of an individual to be actively engaged in decision-making and problem-solving regarding issues related to climate change. The framework describes disposition as an individual's concern about climate change as an environmental problem and optimism as the belief that initiatives taken will lead to positive results. Disposition also pertains to having a sense of responsibility and accountability to provide solutions as well as commitment to take action to lessen the effects of climate change. This study reveals that majority of the respondents expressed concern about the effects of global warming in the country. Majority of the respondents also exhibited a positive sense of responsibility and commitment toward lessening the impact of climate change. This latter finding suggests that the respondents had a stronger inclination to be actively engaged in proposing and implementing climate change adaptation strategies. In light of this, a climate change literacy program may be designed

to emphasize the specific ways by which an individual can respond to climate change-related issues.

Competencies. Competencies pertain to the general skills and abilities that the climate change literacy program should make possible. These skills and abilities are directly measureable indicators of an individual's knowledge and disposition towards climate change. Specifically, the literacy program must direct learners to identify, analyze, and ask questions about climate change. It must also guide them to investigate and evaluate climate change issues, thereby creating and evaluating strategies to climate change adaptation.

Environmentally responsible behavior. The ultimate goal of the climate change literacy program must be to prepare the learners to participate in service and action programs that help improve the adaptation strategies of the community towards climate change. The context of the community must also be considered because different community types may have different levels of knowledge, dispositions, and competencies. The goal of the literacy program must be to train learners to show intentional and habitual behaviors, individually or as group members.

Conclusions

In view of the foregoing results and discussion, the researchers pose the following conclusions:

- Low conceptions of climate change were observed. This observation brought up the need for a more intensive strategy to better inform and educate basic education learners about the phenomena of global warming, greenhouse effect, and climate change.

There is also a need to intensify the information campaign at the community level.

- Majority of the respondents exhibited a positive sense of responsibility and commitment toward lessening the impact of climate change. The climate change literacy program may, therefore, be designed to emphasize the specific ways by which an individual can respond to the issues on climate change.
- Indicators such as skills and competencies that directly measure the interaction between an individual's conception and disposition toward the aforementioned phenomena should be clarified to enable the development of strategies for climate change adaptation.
- The context of the community must be considered because different community types have different levels of knowledge, dispositions, and competencies.
- The ultimate goal of the climate change literacy program is to prepare and train environmentally responsible individuals to participate in service and action programs that will help improve the adaptation strategies of the community towards climate change.

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Featured Researcher

Dr. Jaime S. Ong

Prior to joining DLSU, Dr. Jaime S. Ong or “Jimmy” to colleagues and friends, worked with San Miguel Corporation where he held various executive positions, such as senior vice president for Corporate Quality (1997 until his retirement in 1998), executive assistant to the chairman and chief executive officer (1993 to 1998), vice president – Management Training Center (1993 to 1997), and vice president – Organization & Management Development (1991 to 1993). He was a professorial chair lecturer at the College of Mass Communication (1980) and lecturer at the Institute of Mass Communication (1971 to 1973) at the University of the Philippines Diliman. An adjunct faculty at the Enderun Colleges in McKinley Hills in Taguig City, Jimmy taught Business Communication (June 2010 to December 2013). He also served as a consultant and lecturer on Total Quality Management (TQM)/Philippine Quality Awards (PQA) with ACF Training and Consultancy. PQA is the national government’s highest recognition for organizational excellence, which is patterned after the Malcolm Baldrige National Quality Award of the USA. A communication *guru*/expert, Jimmy was a senior writer at the Philippines Herald (1972). He was also editor/contributor of the Manila Bulletin’s “Business Focus,” a weekly column that features articles written by the faculty of DLSU’s College of Business and Economics (2002-2005) and contributor of Manila Times (2004).

In 1999, he joined DLSU where he served in various capacities. He was associate professor of the Marketing Management Department (1999-2010) which he chaired for seven years (2001-2008) and where he taught Consumer Behavior, Services Marketing, Public Relations, Human Resource Management, Total Quality Management, and Corporate Communication. He also taught Shakespeare, British Literature, World Literature, English and American Literature, Literature and Film, Japanese Cinema, and Great Works (World Masterpieces) under the College of Liberal Arts (1999-2010). Jimmy likewise taught part-time as a professorial lecturer at the Graduate School of Business (1984).

Possessing an insatiable desire for continuous learning, he made it a point to update himself on the latest developments, especially in his field. He completed several management



seminars, including: Management Development Program at the Asian Institute of Management (1975), Seminar in Management Development at the International Institute of Management Development in Switzerland (1982), The Executive Program at the University of California at Berkeley (1989), and Joint Ventures: Human Factor, at the INSEAD, Singapore (1994).

Jimmy was a recipient of a Ford Foundation Fellowship (1967) and a Stanford University Fellowship (1968 to 1970). He was a holder of the J. Romero & Associates Chair in Advertising and the Jose Ma. Santamaria Academic Chair of Multimedia Advertising.

His works have been published in online and printed refereed national and international journals/newspapers. Some appeared in *Screening the Past*, the online journal of La Trobe University in Australia ("Joseph Epstein's Fred Astaire" (2008), "Scott Nygren's Time Frames: Japanese Cinema and the Unfolding of History" (2007), "Steve Cohan's Incongruous Entertainment: Camp, Cultural Value and the MGM Musical" (2006), "Pamela Church Gibson's More Dirty Looks: Gender, Pornography and Power" (2005), "Adam Macauley's Don't Tell Me, Show Me: Director's Talk About Acting" (2004), "Paula Marantz Cohen's Silent Film and the Triumph of the American Myth" (2002), *The Drexel Online Journal* of Drexel University, Philadelphia, USA ("From Term Paper to Putsch"), and in various academic publications and national dailies in the Philippines. His other writings were published by Anvil in Great Men and Women of Asia: Ramon Magsaysay Awardees 2006-2007 and Awardee Organizations 1958-2006 ("College of Agriculture, University of the Philippines at Los Baños, 1977"), Great Men and Women of Asia: Ramon Magsaysay Awardees from Southeast Asia, 1990-2005 ("Jesse M. Robredo: Yielding Power to the People"), and Great Men and Women of Asia: Ramon Magsaysay Awardees from Southeast Asia, 1990-2005 ("Teten Masduki: Anti-Corruption Crusader").

His work entitled "Cruz, Isagani Ronquillo (1945) Filipino critic, playwright, short story writer and biographer" appears in the Encyclopedia of Post-Colonial Literatures in English edited by Eugene Benson and LW Corolly (London, Routledge, 2005), while "*Wordsmith With a Slingshot: The Gerry Gil Book*, which he edited with an introduction won the 1997 National Book Award for Journalism. Another article entitled "Levels of Consumer Dissatisfaction and Complaint" (2007), which he co-authored with Allen Go, a DLSU Marketing Management faculty, appeared in *The Marketing Educator*, the official journal of the Association of Marketing Educators.

Much sought after by colleagues and in his professional circle for his extensive experience, keen sense of quality, and wisdom, Jimmy has had several professional involvements which include: membership in the boards of judges/jurors of the Philippine Quality Awards (2007 and 2008), the Anvil Awards of the Public Relations Society of the Philippines (January 2008 and January 2010), the Toyota "Driving Tomorrow" Journalism Awards sponsored by Toyota Motor Philippines Corporation (September 2008), and the Commission on Higher Education – National Capital Region Quality Assurance Team (March 2006 and February 2010); chairmanship of the Board of



FEATURED RESEARCHER

Judges at the Student Grand Prix of the PRSP (September 2007); and being a judge at the “CEO Excel Awards” of the International Association of Business Communications (Philippines) (November 2005 and October 2009). He also served as expert/consultant of “Romeo and Juliet,” a Telecourse for Teachers of Literature for Continuing Studies via Technology, which is a project of the Foundation for Upgrading the Standard of Education (2008), and as a pre-screening judge for “Shakespeare Speech Competition” of the British Council (Philippines) (August 2005) speak of his evident passion for Shakespeare.

As a mentor, researcher, writer and friend, his colleagues in the department, especially Ms. Mary Julie Tañada and Mr. Allen Go, fondly spoke of his admirable dedication to his profession as evidenced by his perfect attendance in class. Julie recounts how despite being endowed with so much wisdom, Jimmy seldom volunteers a personal advice, but when he does, he hits his listeners right into the heart. Fellow table tennis enthusiasts had a regular dose of his cool sense of humor. A faithful husband and a doting father, Jimmy spent quality time traveling or dining with his wife and children despite his tight schedule. Meanwhile, Allen, a former student who later became his colleague at the Marketing Management Department, describes Jimmy as a “perfectionist” with genuine concern, particularly for the students. Allen vividly narrated how Jimmy would ingrain in his students the values of promptness, time management, and continuous research, even after they are done with their thesis work. In times when his mentees were on the verge of giving up due to the rigor in conducting research, he was always ready to guide them and offer words of encouragement. There were also times when he would call to his office graduate students, especially colleagues pursuing their graduate studies, to give them a boost and encourage them to start working on and finish their thesis. Many of his former students and colleagues, who are now successful professionals, warmly appreciate such gesture. He inspired them to achieve what they thought was impossible until they became who they are now. To Allen, Jimmy is an epitome of a true and devoted educator; an excellent mentor; a genuine friend; and, above all, a “dad,” who was not only sensitive to the needs of his colleagues and students but also ready to lend a hand.

Jimmy earned his Ph.D. in Communication and M.A. in Communication from Stanford University, USA, in 1980 and 1968, respectively. He graduated with a Bachelor of Arts degree in English from the University of the Philippines in Diliman, Quezon City in 1966.

Note: Jimmy joined our Creator in December 2013 at the time materials for this report were being gathered. He is survived by his wife Cynthia and two children, David and Ela.

PHILIPPINE CHEMICAL INDUSTRY MASTER PLAN 2012-2030

Dr. Aida Licaros L. Velasco ■ Dr. Maria Victoria P. Tibon ■ Mr. Nelson J. Celis ■ Ms. Eula Bianca J. Villar
■ Ms. Salie Ann T. Siao ■ Mr. Joren Lex A. Tan

Introduction

The chemical industry is considered as one of the pillar industries of the Philippine economy because it supports all other sectors, namely: agriculture, service, and manufacturing. To ensure its sustainability, the government periodically reviews its targets and performance, as well as sets the industry's future directions along with those of other industries. The Department of Trade and Industry (DTI), the lead agency involved in setting the mission-vision and directions, drafts an agenda for the development of various industries and holds periodic consultations with private sector representatives. In response to the DTI agenda to plan the future direction of Philippine manufacturing and agro-based industries, the Philippine Chemical Industry Roadmap (PCIR) 2012-2030 was initiated by the Samahan sa Pilipinas ng mga Industriyang Kimika (or Chemical Industry Association of the Philippines).

The Roadmap

The Philippine Chemical Industry Roadmap sets the vision and strategies of the chemical



The **Center for Business Research and Development (CBRD)** envisions itself to be a leading research institution producing scholarly work and influencing business and policy in the Philippines and Asia-Pacific region. It focuses its research thrusts on business education, entrepreneurship, and policy-making. It positions itself to become the cradle of SME growth and sustainability in the country. CBRD was established in 1996 as the Center for Business and Economic Research and Development (CBERD), the research arm of the College of Business and Economics (CBE). In 2010, CBE was split into the College of Business (COB) and School of Economics (SoE). The center was renamed CBRD and was retained by the COB. For the past 17 years, collaborative research in business and economics has been undertaken by the center, covering a wide range of topics and policy issues in these disciplines. It has prepared teaching materials on business education and rendered consultancy services for the government, business sector, non-government, and international organizations.



industry based on three timeframes: short-term (2012-2016), medium-term (2017-2022), and long-term (2022-2030). It has developed strategies to achieve the targets set for the different time horizons.

The roadmap was developed in consultation with the different industry stakeholders (industry decision makers, government policy makers, faculty, and researchers). Four workshops were held with representatives from all sectors of the industry as participants. Focus group discussions were held for each of the subsectors to identify the issues and concerns as well as the support that the subsector needs. The document integrates the vision of the different subsectors of the chemical industry. Possible strategies and policy recommendations were also crafted and elicited. Industry analysis, environmental scanning, and an analysis of the strengths, weaknesses, opportunities, and threats to the industry have been undertaken. These activities are expected to achieve a holistic view of the playing field of the chemical industry at the local, regional, and global levels.

As a result, the project presents key data that illustrate the national, regional, and global landscape upon which the Philippine chemical industry is positioned. The industry stakeholders have agreed to pursue a common vision that emphasizes the following goals:

- A. The creation of a wide range of products with the best customer value;
- B. The satisfaction of the domestic demand and becoming a leading contributor to the Philippine export basket;
- C. The promotion of a high level of workforce productivity;
- D. Being innovative, both in products and processes;
- E. The development and management of the industry for sustainability by protecting the natural assets/resources on which the industry depends; and
- F. The attainment of competitiveness as an industry and reap benefits for the Philippine economy and the Filipino people.

Strategies pertaining to the three timeframes earlier mentioned have been developed by the industry based on the inputs from the focus group discussions and the series of consultations/workshops with key stakeholders. The results of these forums are a triple gear recommendation with the following pillars:

- A. The creation of an Engineering and Science Advanced Technology (EnSAT) Program that would develop the technical and scientific skills of Filipinos;
- B. Putting in place legislative policies that are based on sound technical and scientific studies that consider the total system within which the chemical industry operates; and
- C. The establishment of a chemical industry cluster to achieve cost-efficiency in the manufacture of chemical products.

The government is considered as the major stakeholder in the three gears, where it serves as the enabling mechanism that will allow for the smooth implementation of the recommended programs. Detailed action plans and responsible entities from industry, government, academe, and civil society have been identified for this project.

Vision, Goals and Targets

Planning for the future of the Philippine chemical industry is guided by a vision that articulates the future that its stakeholders want to create, and which is achievable within a span of around two (2) decades. The vision and the resulting long-term plans reflect the contributions of the stakeholders represented at the various stakeholder consultations that were held during the Vision 2030 planning process.





Vision Statement. The Vision Statement for the Philippine chemical industry in 2030 clearly states,

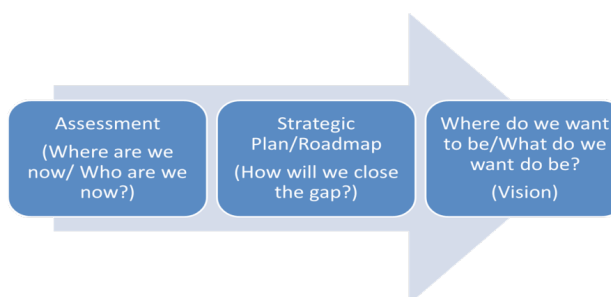
“The Philippine chemical industry shall engage in transforming the nation’s basic resources into a wide range of higher value products that serve domestic as well as global market needs with the best customer value. It is committed to attracting, developing, and retaining the best talents who will be at the forefront of product and process innovations, while adhering to sustainability and Responsible Care principles. By relentlessly improving products and processes, it will achieve sustainable growth and, thus, contribute to the nation’s inclusive growth and socio-economic development.”

Strategic Vision. The long-term strategic vision for the Philippine chemical industry is built on various themes or strategic priorities, including the following:

A. A chemical industry that adds value to the nation’s basic resources and creates

a wide range of products with the best consumer value.

- B. A self-sufficient industry that satisfies the domestic demand and serves as a leading contributor to the Philippine export basket.
- C. A chemical industry that promotes a high level of workforce productivity.
- D. A highly innovative industry, both in products and processes.
- E. A chemical industry that is sustainably developed and managed to protect the natural assets on which the industry depends.
- F. A chemical industry that is competitive and provides benefits to the Philippine economy and to the Filipino people



Strategic Approach. The strategic planning for the Philippine chemical industry is based on the assessment of the industry's strengths, areas that need improvements, and issues that confront it. The Philippine Chemical Industry Vision 2030 gives the industry a strong identity and provides a long-term direction to realize what it is capable of becoming. The plan focuses on the development of goals which, when taken together, enable the industry to achieve the Vision. Objectives or associated outcomes, which support each goal, as well as targets aligned to the objectives that serve to measure progress in implementing the plans over time are identified.

Goals. The main goals of the Philippine Chemical Industry Roadmap are presented below. They comprise the elements that make up the common picture of the future through which Vision 2030 are expected to be realized.

Goal 1: Create a wide range of products with the best customer value.

Goal 2: Satisfy the domestic demand and be a leading contributor to the Philippine export basket.

Goal 3: Promote a high level of workforce productivity.

Goal 4: Innovate, both in products and processes.

Goal 5: Develop and manage industry sustainably to protect the natural assets on which the industry depends.

Goal 6: Be competitive as an industry to be able to provide the best benefits to the Philippine economy and to the Filipino people.

Objectives and Targets. The objectives or associated outcomes are the desired results

which are sought under each goal. Progress in achieving these results will be measured by indicators and assessed against targets that are aligned to these objectives.

Conclusion

The Philippine Chemical Industry Roadmap 2012-2013 is intended for the use of government, industry, academe, and research institutes. Through the roadmap, the government will be guided on how to provide the right infrastructure and policies to support the attainment of the industry's vision. Meanwhile, industry stakeholders can better plan their business given the vision that the government will support. The roadmap can make the industry more proactive in articulating issues and concerns that should be addressed to enable the growth of the chemical industry. As regards the academe, the roadmap can guide universities on the appropriate curriculum that will make their capabilities and resources compatible and consistent with industry needs. Research centers and institutes can benefit from the roadmap by exploring research opportunities that can be done in support of the industry.

Data on the present situation of the chemical industry, trends and long-term prospects are summarized in the report. Recommendations to the government, academe, and industry players along with specific action plans as well as the corresponding responsible agencies and entities have also been identified.

CAREER GUIDES FOR KEY INDUSTRIES

Dr. Tereso S. Tullao, Jr. ■ Dr. Roderick C. Bugador ■ Ms. Ma. Concepcion G. Latoja ■ Mr. Dickson A. Lim ■
Ms. Paulyne J. Castillo ■ Ms. Madeleine V. Balane ■ Ms. Rhory C. Fernandez ■ Mr. Christopher James R. Cabuay ■
Ms. Denise Jannah D. Serrano ■ Dr. Roberto B. Raymundo ■ Ms. Veredigna M. Ledda ■ Ms. Mitzie Irene P. Conchada ■
Mr. Kurt Gerrard T. See ■ Ms. Ma. Concepcion G. Latoja

Introduction

In 2013, the De La Salle University Angelo King Institute for Economic and Business Studies (AKIEBS) finished the project *Development of Industry Career Guides for Selected Industries*. The Department of Labor and Employment – Bureau of Local Employment (DOLE-BLE) commissioned the research team to prepare these guides to respond to the need for information among players in the labor market. The lack of information has led to the mismatch problem between the graduates of educational institutions and the human resource needs of various industries. This information gap has plagued the local labor market for decades. These industry career guides are, thus, meant to narrow the gap. Specifically, six industries were included in the first round of study done in 2011, namely: agribusiness, construction, health and wellness, mining, transportation and logistics, and information technology –business process outsourcing (IT-BPO). In the second round, four industries, identified by DOLE-BLE as emerging industries, as well as industries that may serve as potential drivers of the economy, were included. These



Angelo King Institute for Economics and Business Studies. Established in 1999, the De La Salle University – Angelo King Institute (DLSU-AKI) was inspired by the complementary noble goals of DLSU and the Angelo King Foundation, its two founding institutions. Committed to becoming “a leading learner-centered research university” in Southeast Asia, “bridging faith and scholarship in the service of society, especially the poor,” the university participates actively in improving the quality of life in Philippine society and the region. Through the Institute, the Foundation addresses its overriding concern, which is poverty alleviation, by pushing for appropriate government policies and by promoting entrepreneurship and self-help among economically disadvantaged groups.

are: banking and finance, manufacturing, ownership of dwellings and real estate, and wholesale and retail trade.

This study provides an overview of the current state of the ten industries and a thorough discussion of their potential growth and employment prospects. The research also identifies the necessary policy adjustments that may need to be undertaken in order to improve competitiveness as well as encourage new investments.

Methodology and Framework

With the aim of developing an initial draft, the study collected mostly secondary data from the private sector, industry organizations and associations, and government agencies. The research team also conducted focus group discussions with industry leaders, industry associations, and the heads of government agencies to verify the work.

The career guides are divided into four sections. The first section discusses the nature of the industry. It looks at the kind of work being done in most of the establishments and in the various sub-sectors that constitute the industry. The economic profiling provides a glimpse of how the industry is doing in terms of economic, demographic, and political measures, not to mention developments that the industry has gone through in recent years.

The second section provides a glimpse of the general employment details of the industry, which entails the enumeration of the various occupations that constitute the different sub-sectors of the industry. It classifies the employment levels (both relative and absolute) in the various sub-sectors and across regions in the country. It also identifies the common factors among the occupations like basic/educational requirements, competencies, personal qualities, and terms of employment as well as professional licensure requirements.

It likewise outlines the core occupations that are essential to the operations of the industry, along with in-demand and hard-to-fill jobs in the sub-sectors.

The third section is a more in-depth discussion of the industry occupations. It discusses the common working conditions in various occupations and sub-sectors, describing the nature of employment, working hours, work environment, fringe benefits, and occupational hazards. Included in this section are the average monthly earnings of occupations and industry revenues, as well as training and advancements provided to employees in the sub-sectors. This section discusses in detail the various occupational groups and sub-sectors, describing the nature of their work, job responsibilities, educational/basic/professional requirements, competencies, personal qualities, tenure, working environment, working hours, advancement and training, salary range, and prospects.

The last section describes the industry, detailing its prospects, as well as providing a general job outlook for the various occupations. It gives an idea of the dynamism of the sector, identifies technological innovations and developments in business practices, and government regulations. It also illustrates the status of the labor market and employment prospects as well as the various issues and challenges confronting the industry. Finally, it recommends policy actions to address the issues and challenges that have been identified.

A Glimpse of Agribusiness

Agribusiness is the commercial aspect of agriculture which is supported by both manufacturing and services. It entails input production, farm operations and management, equipment and supplies manufacturing, food and non-food processing from trading

stage to retailing. Though this industry is struggling to remain competitive amidst the institutionalization of various free trade agreements (FTAs) the Philippines has forged with other countries, these FTAs may also serve as a motivating factor and can provide a larger market for agribusiness enthusiasts in the country. A good business model for larger agriculture businesses is to partner with local indigenous communities and subcontract smaller “backyard” farms because this generates employment. A key driver for this sector, as well as a key prospect for employment, is entrepreneurship derived from agricultural production, which requires formal education in agricultural entrepreneurship and agricultural engineering.

A Glimpse of Construction

Construction encompasses the scoping of the feasibility of a construction idea up to its design, thereby erecting physical structures and maintaining them. In general, construction deals with the creation and maintenance of structures ranging from simple housing projects to vast urban malls, infrastructure, and even power plants. Among the most needed skills and jobs in this industry are those of architects, civil engineers, construction managers, as well as construction equipment operators, skilled carpenters, and electricians. Currently, the nation is experiencing a growth in the construction of dwellings and condominiums, which is seen to further drive the expansion of the sector.

A Glimpse of Health and Wellness

Health and wellness is a service industry that ranges from hospital care and treatment (hospitals, sanitarium, etc.), specialty clinics

(dental and laboratory services), wellness and spa centers (body-building services, massage, reflexology, facial, nail care, waxing, and body treatments), to retirement and rehabilitative care (residential institutions for retirees and orphans and rehabilitation for people addicted to drugs or alcohol). The most needed skills and jobs in this sector are health professionals, particularly doctors of any specialization and dentists. There is a great need for these jobs in the Philippines because most health workers choose to work overseas for higher wages. There is a very strong demand for this industry from foreigners who come to the Philippines for medical tourism. The sector needs to capitalize on its strengths: low cost, ability to combine western medical knowledge with traditional and alternative remedies, quality of service being comparable with those of hospitals, and support from the government.

A Glimpse of IT-BPO

The Information Technology – Business Process Outsourcing (IT-BPO) sector is primarily engaged in off-shoring and outsourcing; that is, relocating a company’s business processes and contracting external third parties to perform the necessary processes for businesses, respectively. The industry is composed of eight sub-sectors: contact centers, knowledge process outsourcing and back offices, software development, animation, game development medical transcription, and engineering design. The largest components in the sector, and perhaps one of the largest in the country, are the contact centers. Among the key occupations experiencing a high demand in the sector are call center agents in voice operation services. Other sub-sectors are still in the process of growth and have varied needs in terms of skills and employment, such as: transcriptionists,

consultants in various fields, animators, software developers, and engineers. The IT-BPO industry is one of the most dynamic industries and proves to be a key towards the future of the country because of the increasing share and rapid expansion of the services sector. Currently, the country's IT-BPO sector is competing with India and China and is proving to be highly competitive especially with innovations in ICT infrastructure and the population's superior command of the English language. Although many of its sub-sectors are still emerging, IT-BPO can be one of the key drivers of the Philippine economy with proper investment and improvements.

A Glimpse of Mining

Mining is the exploration, extraction, and processing of minerals used in industrial development such as coal, ores, crude, petroleum, and natural gas. The industry and its sub-sectors revolve around four stages: exploration; development and construction; utilization and commercial operation; and decommissioning, final mining stage, and rehabilitation. Among the needed occupations and skills in the industry are mining engineers and geologists. Despite being highly controversial in political and social arenas (i.e., issues of environmental degradation and negative spill-overs to agriculture that have been raised against the industry), mining has experienced a steady growth over the past five years with support from the private sector and the government, as well as steady entry of foreign-owned mining corporations. A good compromise between sound environmental protection and effective regulation of mining activities should reduce the hostility coming from anti-mining advocates and promote efforts to tap the country's unused mineral potential.

A Glimpse of Transportation and Logistics

The transportation and logistics sector is a service industry that deals with the physical movement of persons and goods. Logistics specifically refers to the transit of goods, materials, or products using the basic channels of transport such as road, rail, water, and air. Covered under this sector are the management of freight, storage, packaging, and inventory. The occupations needed in the industry are greatly diverse. They range from self-employed tricycle, jeepney, truck, and bus drivers, to more skilled jobs of piloting aircrafts, among others. In the shipping sector, engineers are needed for maintenance and operations on board, whereas cruise liners require a large variation of jobs ranging from ship captains and maintenance crew, to hotel and restaurant managers and baristas. The sector has experienced steady growth over the years, but much investment and improvement is required in infrastructure such as roads, train stations, seaports, and airports, to facilitate further growth.

A Glimpse of Banking and Finance

The banking and finance sector is primarily responsible for the mobilization of domestic savings and the conversion of these funds to increase productive investments, such as additional capital equipment, acquiring or leasing idle property, building and expanding factories, and increasing inventory. The jobs that are most in-demand in this sector include tellers and accounting clerks, operations managers, finance analysts, accountants, and risk managers. Growth in the industry has been steady for a long time because it accompanies real economic growth. For as long as investments are being supported in the

private and government sectors, expansion of business will always require the capital and liquidity provided by banks and financial intermediaries.

A Glimpse of Manufacturing

The manufacturing industry is part of the industrial sector that is involved in the mechanical or chemical processing or transformation of organic or inorganic inputs into intermediate or final products. The manufacturing industry is one of the largest industries in the country and much variation goes into the processes and the skills required. It has 20 sub-sectors, many of which have several sub-branches. Food manufacturing is the largest sub-sector in terms of the number of establishments, while electrical machinery and other electronic components (particularly semi-conductors) are the largest in terms of employment. The most in-demand occupations in the industry include managers and professionals (particularly all kinds of engineers), as well as production, plant, and equipment operators. It has long been an issue that the manufacturing sector in the Philippines is slowly dying (i.e., losing contribution as compared to the services sector). However, it has received much support from the private sector and accorded top priority in government investments. The visiting ASEAN Economic Community may also serve as a major driving force for the revival of this sector as it will be able to share in the technology of other ASEAN countries.

A Glimpse of Ownership Dwellings and Real Estate

Ownership of dwellings pertains to the provision of housing services on individual

accounts, looking at owner-occupied dwelling units and imputed rent. Real estate covers the renting out, management, and operation of residential and non-residential buildings; subdivision and development of land; the operation of residential and industrial estates; cemetery development and sale; brokers and managers engaged in renting, buying, selling, managing, and appraisal of real estate for a fee or contract basis. As the nature of the industry focuses on the service side (i.e., construction being its industrial counterpart), concentrating on the sale of finished units, in-demand occupations include sales and marketing managers, finance and administration managers, and sales representatives, as well as licensed civil and mechanical engineers who may serve as building managers. Much like the banking and finance industry, ownership of dwellings and real estate is driven by the economy, particularly the purchasing power of consumers. There has been a recent surge in the number of condominiums built by moguls such as SM, Ayala, and Megaworld, which seek to tap both domestic and foreign savings. This ensures the growth of the industry in the years to come.

A Glimpse of Wholesale and Retail Trade

Wholesale and retail trade is a service-oriented industry focused on the distribution – not the production – of durable and non-durable goods to households and other firms. The industry has three main divisions. First is the sale, maintenance, and repair of motor vehicles and motorcycles, along with retail sale of automotive fuel. Second is the wholesale and commission trade, except of motor vehicles and motorcycles. Third is retail trade, repair of personal and household goods except of motor vehicles and motorcycles. Among the highly in-demand occupations in the industry are supply and distribution managers, telemarketers,

and sales representatives although these are generally easy-to-fill. To some extent, technical occupations like mechanics are also needed in the industry, especially in the maintenance and repair of motor vehicles and motorcycles. The growth of this industry is much like ownership of dwellings and real estate as well as banking and finance as it is largely driven by the purchasing power of consumers. This is hastened by the development in ICT infrastructure especially since advertising has been made easier with landlines, mobile phones, computers with Internet access, and social media. Thus, the industry is expected to grow steadily in the years ahead.

Concluding Statement

With proper support, particularly from the government, the foregoing glimpses into the different industries can help provide the much needed information to ensure that the country's graduates would easily find employment that matches the skills they have trained for and acquired in college, and thereby contribute toward a significant reduction in the country's unemployment rate.

THE HEALTH DIMENSION OF ASIAN MIGRATION TO EUROPE

Dr. Trinidad S. Osteria ■ Dr. Daniela Carrillo ■ Dr. Annavittoria Sarli

Introduction

Migration has become a constituent element of the European Union (EU). Using different adjustment strategies, ethnic communities have found their place and role in the labor markets of the receiving countries. They usually fill labor shortages in sectors which tend to be less attractive to the native workforce. Several scholars see the integration of migrants as a potential catalyst to a transformation process linked to globalization and beneficial to the EU society. The migrants do fill labor shortages and provide a temporary strategy in delaying the welfare crisis. Some scholars also point out that the presence of migrants stimulates the adoption of diversity management strategies in private and public workplaces, in organizations of civil society, or in public administrations (Zanfrini, 2011).

As populations become heterogeneous, societies have to adapt, within the context of the coexistence of the migrants and the host populations (European Union, 2008). In light of this, the promotion of the full social and economic integration of the migrants in the



The **Yuchengco Center** conducts innovative studies and produces excellent research outputs that highlight friendly bilateral relations between the Philippines and Japan and other groups in neighboring countries. It seeks to heighten public knowledge and awareness of political, economic, and social policy concerns in the Philippines and the Asian region, and to enhance its role as a think tank whose outputs are regularly transmitted to the end users for evidence-based legislation, policy formulation and program planning. The Center received an award from the Japanese Government for its invaluable contribution to the promotion of mutual understanding and friendly relations between the two countries through researches, conferences, and publications.

Inaugurated on August 29, 1994, the Center was initially called Yuchengco Institute of Philippines-Japan Relations. Its Board of Trustees renamed it Yuchengco Center for East Asia in 1997 to reflect the expansion of its concerns to Northeast and Southeast Asia. In 2002, the Board shortened its name further to Yuchengco Center to signify a shift towards a broader perspective that is more issue-oriented and policy-focused.

receiving communities entails an inclusive and multi-faceted growth. If supported by adequate policies, this integration has the potential to reinforce the EU's demographic shortage, social cohesion, and economic competitiveness.

The Study on the Health Dimension of Asian Migration to Europe

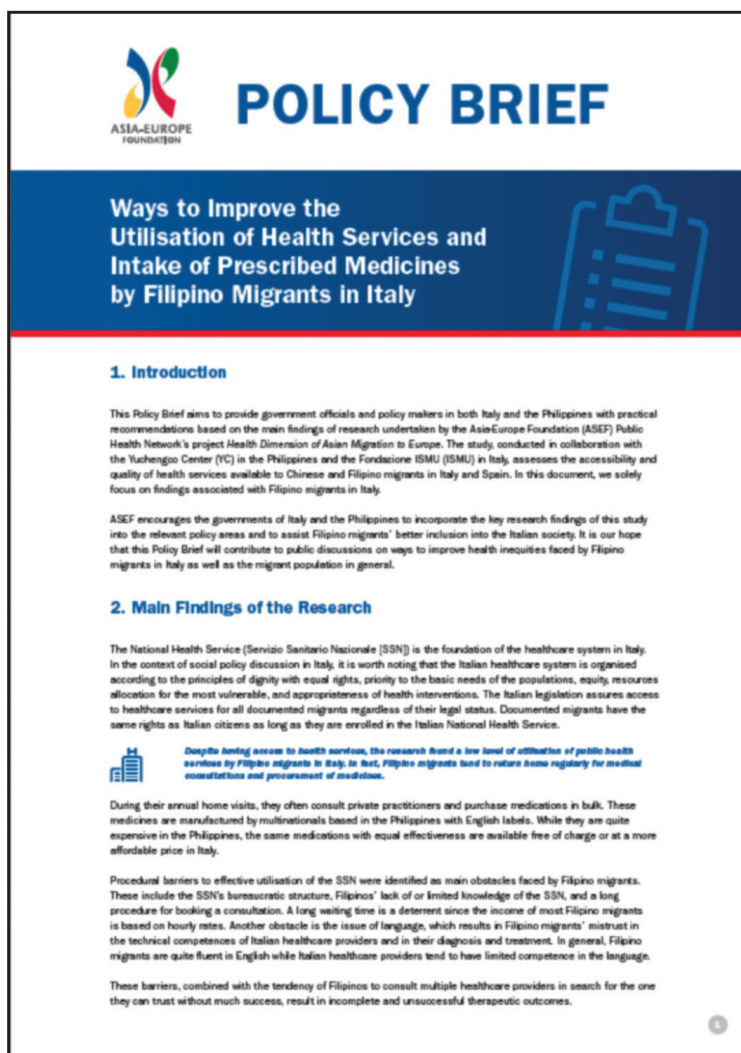
The Yuchengco Center of De La Salle University in the Philippines and the Fondazione Iniziative E Studi Sulla Multietnicita (ISMU) in Italy jointly sought to study the implications of Asian migration in Europe in relation to health policies. The study was initiated in September 2011, undertaken for six months, and conducted in Madrid and Milan among Chinese and Filipino migrants who are among the largest groups of Asian migrants in Spain and Italy.

Three major approaches were employed to understand the institutional and policy frameworks governing the health services provision and to determine possible bases for policy modifications in the two countries. These were desk reviews, interviews, and focus group discussions.

The desk review looked into the demographic, socio-economic, and health characteristics of the migrant population and the health policies of the sending region (Asia) and countries (Philippines and China) and the receiving region (Europe) and countries (Spain and Italy). It examined literature pertaining to the health risks and predicaments of the two groups of migrants as well as the health system responses in Spain and Italy. Then, it analyzed recommendations and prescriptions related to the migrants' health, drawn from numerous conferences, documents issued by EU institutions, and World Health Organization mandates.

The interviews with the Chinese and Filipino migrants sought to draw information regarding their health problems, health management, health service utilization pattern, and experiences with and attitudes toward the health providers. They also gathered recommendations for the possible improvement of utilization and provision of services. In each case, the sample size was ensured to be significant, and the selection was random to ensure internal validity and lessen selection bias. The questionnaire and interviews were guided by the objectives of the study.

An occupational profile of the migrants interviewed reveals that they were Filipino female domestic workers, Filipino male



restaurant cooks and waiters, Chinese female shopkeepers and restaurant owners, and a Chinese male shopkeeper. The health providers interviewed from different health centers included a physician and two public health nurses in Madrid and three gynecologists, two specialists in infectious diseases, two nurses, a pediatrician, a general practitioner, and a psychologist and psychomotility therapist in Milan.

The focus group discussions (FGD) were conducted among key Chinese and Filipino residents in Madrid and Milan who had been there for at least 10 years. Most of them were active in their community. They were either workers in the health sector or representatives of their communities. The FGD sought to gather information on their perceptions of the health system, current usage of health services, barriers to migrants' efficient access to services, and changes in the provision of healthcare. The selection of FGD participants was purposive and non-probabilistic.

General Findings

Illness Patterns of Chinese and Filipino Migrants

In Madrid. The most mentioned illnesses among the Chinese migrants were mild respiratory infection, diarrhea, and musculoskeletal problems related to work. Their chronic problems were hypertension, kidney diseases, and diabetes. They sought medical assistance only after home and traditional remedies failed to improve their conditions. Among the Filipino migrants, the most mentioned ailments were cough, colds, and flu, which they have manage at home, and cardiovascular and circulatory problems.

At the time of the study, there had been improvements in the health programs in both China and the Philippines. Thus, there had

been a shift from communicable to infectious diseases among the top ten causes of mortality to chronic and non-communicable diseases in these countries.

The possibility that the migrants had already chronic illnesses prior to their entry to Spain was also considered, along with the possibility that their conditions may have been exacerbated by stress and a change in their dietary patterns.

Filipino migrants attributed the causes of infectious and chronic illnesses to changes in weather conditions, dirty surroundings, and transmission by sick persons.

In Milan. Both groups of migrants said that their recurrent health problems were mostly respiratory tract infectious and allergies, which in most cases were ascribed to asthma. Asthma was blamed on the change in climate, contact or proximity to sick people (according to the Chinese), and incorrect or poor diet (according to the Filipinos). The other health problems cited were mostly work-related fatigue and stress, lack of sleep, and poor self-care. Alcohol abuse among the Filipino males was also noted.

Both migrant groups had a tendency to underreport health concerns and to opt for self-medication. The Chinese preferred to use traditional medicines, and the Filipinos opted for pharmaceutical drugs. Both also bewailed the lack of campaigns aimed at educating migrants on the prevention of chronic illnesses and the promotion of healthy lifestyle. The various initiatives aimed at educating the entire population on how to live healthily had not reached the migrants fully.

The Chinese and Filipino migrants acknowledged the importance of social activities. However, these activities typically involved heavy consumption of food—i.e., *lechón* (roast pig), *jamon* (ham), and *morcon* (beef dish) among the Filipinos, and duck and

pork dishes among the Chinese. While these activities were necessary for the migrants to overcome their feelings of loneliness and isolation in a new country and their stress from work, these negatively affected their health and well-being.

Health Seeking Behaviors of Chinese and Filipino Migrants

The migrants conformed to what is called crisis orientation. They adopted a two-stage process in managing their health. At first, the Chinese used traditional medicines, mainly acupuncture or herbal medicines bought from friends who regularly visited China. They also used Western medicine. This approach was guided by the concept of *yin* and *yang* (the good and the bad).

The Filipino migrants, on the other hand, initially self-medicated with drugs manufactured by multinational pharmaceutical companies in, and brought from, the Philippines. These drugs were prescribed and purchased in bulk – or were non-prescription drugs – shared by friends and relatives.

When the first-stage remedies failed to improve their conditions, the migrants resorted to the second stage, which was consultations in the Spanish or the Italian public health system.

In Madrid. A significant problem experienced by the migrants in the public health system was the problem of language. The migrants lacked fluency in the Spanish language and could not express the symptoms they had. They also believed that the health care staff did not explain to them their conditions well enough, so they sensed that the latter were incompetent and gave inadequate service.

Visits to health centers in Madrid generally varied in frequency. Some migrants went there

once a month, some every two months, others only twice a year.

In Milan. The Chinese migrants had created their own autonomous system inside their community. They had treatments that partly responded to their particular cultural needs (through traditional medicines and practices), and were partly based on drugs and practices linked to the biomedical system. They patronized their traditional Chinese healers whose competencies were not supported by any certification in Italy. Traditional surgeries of various kinds had emerged over the years in such specializations as dentistry and gynecology. (Even clandestine abortions were carried out). Uncertified consultations and procedures, as well as traditional and allopathic medicines imported from China, were also available in Milan.

The Filipinos' consultations with general practitioners in Milan were of moderate frequency after they had taken self-administered remedies. Compared with the Chinese, however, they more frequently used at average frequency the Italian national healthcare system. They manifested a higher level of understanding of its structure and functions. However, they would go from one doctor to another, indicating only that they did not trust any specific one. Whenever possible, they sought diagnoses and management of their illnesses in the Philippines.

Migrants' Perception of the National Health System of the Receiving Country

In Madrid. Both groups of migrants cited two important constraints to their efficient use of health services: the language barrier and poor client-provider interaction.

The language barrier reportedly led to inadvertent misunderstandings between the healthcare service providers and the migrant populations. As mentioned earlier, the migrants

had difficulty explaining symptoms in Spanish and doubted if they were understood and given the correct diagnoses and treatments by the providers. They also doubted that the interpreters could describe adequately their illnesses to the providers and accurately capture the responses of the physicians. This feeling was compounded by hearsays from compatriots regarding previous misdiagnoses and mismanagement by providers. Medicines were prescribed, but their brands and directions were in Spanish. Thus, the migrants preferred to use medicines imported from their respective countries—even though medicines in Spain were either free or cheaper.

Poor client-provider interaction (as reported by Filipinos) was aggravated by the heavy patient load in clinics. Migrants did not perceive in the Spanish providers the same values of compassion and patience that they saw in local providers in their country. The impersonal attitude of the Spanish providers discouraged the migrants from fully disclosing their health problems leading to inaccurate history-taking, non-adherence to management of medication, and the absence of return visits to clinics. The Filipinos suggested sending Filipino doctors to Spain. However, there are strict medical accreditation requirements in Spain and Spanish-speaking Latinos will have a better edge in this regard.

The Filipino and Chinese migrants believed that the providers' heavy work load affected the quality and the length of their consultations. The long wait in clinics discouraged the migrants from seeking consultations in the national healthcare system. The hours they spent in clinics translated to a substantial loss in their incomes. Usually the Filipinos served two to three households a day and were paid on an hourly basis. The longer the time they spent in health clinics, the greater the loss in their incomes. The Chinese shopkeepers and restaurant servers also lost



Staying Healthy in Italy

How to better use the
Italian healthcare system



wages when they took time off from work for health consultations.

Their lack of knowledge of the confidentiality of consultation is a major setback for the migrants. Both groups found it difficult to consult doctors about specific illnesses such as tuberculosis, sexually transmitted diseases, and mental illness, for fear that their admission of these would lead to their loss of work and/or trigger mistrust and discrimination by employers and the migrant community.

In Milan. Despite the ensured inclusivity of the Italian national health system, its use

by the migrants was low. Both groups also complained of the complex administrative processes in seeking healthcare services. This was probably a reason why the migrants tended to access the healthcare system when they were already in pain. They preferred to use the emergency care facilities more than the primary care options. It was thus difficult to put in place a consistent management system monitored by a systematic followup of cases. This lack leads to the incomplete resolution of health problems, the absence of long term care, and the extreme challenge of monitoring any communicable or infectious disease, especially among the Chinese migrants.

It was learned that the Filipinos were more familiar with the Italian health system, partly owing to their exposure to Italian families with whom they worked who were knowledgeable about how the Italian health care system operated. Yet they seemed to have a low level of trust in Italy's public health system partly due to some pre-conceived notions. In the Philippines, for example, private health clinics were considered more reliable than public health centers. Also, the Filipino migrants were not competent in the Italian language, and both the Filipino migrants and the Italian healthcare providers tended to have low English language skills. Their communication in either English or Italian led the health providers to believe that they had reached a sufficient level of information exchange and did not need linguistic and cultural mediation. While the Italian providers were convinced that they easily communicated with Filipinos, the latter felt that they were not able to fully describe their conditions and sensed that they were always misunderstood and therefore misdiagnosed.

Unlike their Filipino counterparts, the Chinese migrants were more inclined to give up the idea of using the local medical services. Many of them did not make an effort to obtain a medical card, an essential document in

accessing medical coverage, because they had poor Italian language skills and did not know how the Italian health system operated.

The communication problem of the Chinese was both linguistic in nature and linked to reciprocal cultural prejudices. It is important to reiterate that the Chinese migrants preferred allopathic treatments since they were perceived to produce fast results and fitted the users' cultural orientation. The Chinese thus used the Italian healthcare system only when their illnesses had turned serious.

Health Providers' Perception of Migrants

In Madrid. The healthcare providers confirmed that both migrant groups tended to self-medicate before actually going to the Spanish health centers. They also confirmed the existence of the language barrier that hindered a positive client-provider interaction and proper diagnoses and management. Both migrant groups went to the centers for emergency attention, rather than seek primary health intervention.

Providers were unable to understand the descriptions of symptoms and related information expressed by patients in their broken English or colloquial Spanish. They also doubted if the clients comprehended them at all.

Migrant workers did not return to the centers for followup consultations, so most of the time, their records were incomplete. Providers were thus frustrated as they could not get a complete picture of the problems of the patients.

In Milan. The health providers' perceptions of migrants were not different from those of their Spanish counterparts. They also cited the language barrier as a critical issue.

The providers described the Chinese migrants as hermetic, wary of forming a relationship with them and of providing details about their overall state of health. These migrants thought that any direct question was intrusive.

Conclusions and Recommendations

Based on the findings of this study, the project team highlighted two important issues that should be addressed to ensure the health and well-being of the Filipino and the Chinese migrants in Spain and Italy: medical pluralism and the cultural competence of healthcare providers.

Medical Pluralism

Medical pluralism (i.e., alternative therapies in healthcare) should be an area of interest and concern to policymakers and program planners. Recognizing that migrants experience a health system different from those in their own countries, European policy makers and planners must be requested to accept medical pluralism to ensure the health of migrant groups in Europe.

The autonomous system adopted by the Chinese in Italy is based on medical pluralism. The Chinese adhere to principles from their tradition and from the biomedical system. It is advisable that instead of simply banning Chinese clinics in Italy, authorities should regulate and restructure medical centers by promoting an approach based on medical pluralism and fostering collaborations between Italian and Chinese practitioners.

The Filipinos, too, manifested medical pluralism. They preferred biomedical medicines and treatments from the Philippines. Their familiarity with and trust in Filipino brands – even though European brands carried the same generic names – showed that they were not really integrated into the

Italian healthcare system. Hence, a stronger collaboration between the health systems of the receiving and the sending countries should be forged. Workshops and conferences should be held, and an exchange of health workers should be done. These collaborative activities should recognize the contributions that sending countries can give towards a better integration of migrants in their destinations.

Cultural Competence: Improving Communication Gaps in the Healthcare System

Cultural competence refers to the ability of healthcare providers to interact effectively with patients from different cultures. Through the development of their skills in intercultural communication and teamwork with linguistic and cultural mediators, the health providers will be able to understand the cultural viewpoint of their migrant clients and, through constant dialogues outside medical consultations, will be able to consider that viewpoint. Although there were reports of cultural competence courses in medical schools, such training should be reinforced and promoted.

Moreover, training medical and paramedical personnel in the migrants' own countries will result in better communication between the migrant groups and the health system. This measure will also increase the level of recognition of cultural diversity within health institutions in the receiving countries.

The linguistic barrier – particularly the poor communication between providers and migrants – is a major obstacle to a culturally competent healthcare system. It will be important, too, to convey to the migrants the need to acquire linguistic competence.

Migrant community-oriented health education will also benefit the receiving countries' healthcare system in monitoring the spread of illnesses and diseases. Frequent

small group discussions with major migrant groups will increase awareness of their needs, expectations, and medical conditions that may affect the public. For this measure to succeed, a system of communicating with the migrant groups beyond the already existing system of cultural mediators must be set up. Key people from migrant communities should be involved in planning and implementing preventive and promotive healthcare services. Sensitivity to their health beliefs, practices and linguistic needs is important. A qualified cultural mediation/interpretation system incorporated in the national healthcare system is crucial in the formation of strong links with migrants' leadership as well as key resources in the community. This system implies strong community-based participation in promotive and preventive health services. Programs on cultural competence should have strong

migrant participation so that expectations can be discussed by the representative of the national health system and the migrant groups. Best practices from sending countries can be combined with those in receiving countries. The details of this strategy need to be worked out by the local, national, and European health system and the migrant communities.

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Featured Researcher

Dr. Tereso S. Tullao, Jr.

Dr. Tereso S. Tullao, Jr., fondly known as “Jun” to close associates, colleagues, and friends, is a highly esteemed economics educator and dedicated academic leader. The “self-proclaimed owner” of DLSU is well-loved by all sectors of the campus community. He has inspired many of his former students and mentees to eventually join the university’s roster of faculty, researchers, and administrators.

Jun believes that “one must be a ‘synthetic thinker’ in advancing not only in his or her own field by taking information and insight from various other fields and integrating it into one’s own in order to identify and address pressing problems of the country and even of the world” (The LaSallian, 2012).

For him, one must be a critical thinker with an appetite to inquire, as well as the creativity to ask the right questions and translate ideas into concepts that can lead to viable solutions to societal problems.

Highly visible in the media and professional circles, Jun was a columnist for Pinoy Periodiko (July 2013-June 2014), Manila Bulletin (2001 to 2003), and Diyaryo Filipino (January 1991 to June 1992). Apart from his annual professorial chair lectures, which are delivered in Filipino at DLSU and his lectures at the Angelo King Institute and Yuchengco Center, he has presented several papers in various national and international gatherings. His most recent papers delved on trade in professional services (in the China-ASEAN Regional Development Forum 2014 at Guangxi University, China); labor signaling and manpower mismatch (at the APEC Study Center Consortium Conference 2014 in Qingdao, China); movement of natural persons and temporary migration (at the Roundtable

Conference on Strengthening Regional Integration in ASEAN

at the Institute of Diplomacy and Foreign Relations (IDFR), Kuala Lumpur, Malaysia 2013); education and human capital development to strengthen R&D capacity in ASEAN (at the First and Final Workshops of ASEAN and AEC Beyond 2015 Project in



FEATURED RESEARCHER

Jakarta, Indonesia, and in Kuala Lumpur, Malaysia, respectively, 2013); and monitoring impacts of overseas remittances on local entrepreneurship and development (at the 9th Community-Based Monitoring System [CBMS]-Philippines National Conference, 2013).

His research interests include, among others, the role of human capital in development, trade in professional services, and the impact of globalization on various sectors of society including education and health. His ongoing researches delve on “Costing and Financing of Higher Education” and “The Higher Education Accountability and Transparency Portal” (both with grants from Philippine Business for Education); “Employment, Trade and Inclusive Growth in Asia” (Asian Development Bank); “Developing Career Guides for Selected Industries (Phase 2)” (Bureau of Local Employment, Department of Labor and Employment); Education and Human Capital Development to Strengthen R&D Capacity in ASEAN (Economic Research Institute for ASEAN and East Asia); “Establishing the Linkages of Human Resource Development with Inclusive Growth” (Philippine Institute for Development Studies); and “Research Study on the Policy Recommendations for the Expansion of the Securitization Market in the ASEAN+3 Countries” (ASEAN+3 Research Group).

Having an established reputation as an excellent resource speaker, paper presenter, and researcher, Jun has received several invitations to present papers in conferences organized by several government and private institutions, which include the Council of Economics Educators, Department of Foreign Affairs, Philippine Association of Collegiate Schools of Business, Philippine APEC (Asia-Pacific Economic Cooperation) Study Center Network, Philippine, Association of the Japanese Government Scholars, Philippine Association of Administrators of Student Affairs, Philippine Council of Deans and Educators in Business, Lipa City Colleges, University of Santo Tomas, Far Eastern University, Philippine Economic Society, Philippine Institute for Development Studies (PIDS), PIDS-East Asian Development Network, Philippine Overseas Employment Administration, Philippine Retailers Association Reading Association of the Philippines, Sanggunian sa Filipino, SIBS Publishing House, University of the Philippines-Diliman National Institute for Science and Mathematics Education Development, Ritsumeikan Asia Pacific University (Japan), Kyung Hee University (South Korea), Salzburg Seminar (Austria), Waseda University (Japan), Institute for Policy Studies of the University of Singapore, University of Malaya (Malaysia), Assumption University, (Thailand), and the World Bank.

His deep commitment to quality scholarly publication is evidenced by his membership in the editorial board of The Journal of Customs and Trade of the Korea Research Society for Customs (2009 to present); the international editorial board of Daluyan: Journal ng Wikang Filipino of the University of the Philippines-Diliman (2012); and Malay, DLSU’s international journal in Filipino (2000 to present). He remains an active member of the DLSU University Publications Board (May 2013 to present) and serves as editor-in-chief of the DLSU Business and Economics Review (July 2008 to present). Under his leadership, the DLSU Business and Economics Review has been listed in SciVerse Scopus and accredited by the Commission on Higher Education as one of the most distinguished Philippine journals.

Jun is widely respected in his circle and beyond. He has this rare ability to put across ideas without being intimidating and with a touch of humor without deviating from the main point of discussion. These admirable qualities have made him a much sought after mentor by undergraduate students and colleagues taking up their graduate studies. It is perhaps for the same endearing qualities that he has received invitations from outside agencies to serve in various committees and working groups, either as a consultant, research associate, or member. These agencies include, among others, the Commission on Higher Education (CHED) Technical Working Group on the

Medium Term Development Plan for Higher Education (2004-2005), the CHED Technical Working Group on the Human Resource Development Master Plan for Higher Education (1998-2000), the Philippine Institute for Development Studies-Department of Budget Management Project on Streamlining the Bureaucracy (May to June 1993), Board of Investments of the Department of Trade and Industry (May 1988 to September 1990), the Presidential Management Staff of the Office of the President of the Republic of the Philippines (April to July 1986), the Textbook on Development Program of the Bureau of Elementary Education, Ministry Education and Culture (1984-1985), the Andres Soriano Memorial School Project of DLSU's Educational Management Center (1985), and the Educational Development Projects Implementing Task Force (December 1980). Jun also served as a professional staff for the Task Force to Study State Colleges and Universities in the Philippines of the Ministry of Education, Culture and Sports (1986-1987). He has had research collaborations and engagements with the following local and international organizations: The AFTA Advisory Commission (Philippines), the Department of Trade and Industry, The Professors World Peace Academy of the Philippines, Institute of International Studies and Training (Japan), Institute of Developing Economies (Japan), Economic Development Foundation, Economic Research Institute for ASEAN and East Asia (ERIA), World Health Organization, East Asian Development Network (EADN), and United Nations Economic and Social Commission for Asia and the Pacific.



Jun has received various awards and recognitions, particularly from national agencies. Among these awards are the Bayani ng Wika from the Wika ng Kultura at Agham, Inc. (2009), the Metrobank Foundation Award for Continuing Excellence and Service from the Metrobank Foundation, Inc. (2009), the Gantimpalang Quezon sa Panitikan from the Government of Quezon City (1995), National Book Award in Social Science and Economics for *Tungo sa Patakarang Industriyal ng Pilipinas* from the Manila Critics Circle (1994), Metrobank Most Outstanding Teacher award (1993), Gawad ng Pagkilala from the Kagawaran ng Edukasyon, Kultura at Isports Linangan ng mga Wika sa Pilipinas (1991), and a Citation for his *Diksyunaryo sa Ekonomiks* from the Manila Critics Circle (1990).

He became a member of De La Salle University's Society of Fellows when it was established in May 1987. Membership in the Society is considered as the highest award and recognition given by the University to faculty members for consistent research and publication and for effective teaching, meritorious service, and exemplary Christian role modeling. His other awards and recognition from DLSU include being: a recipient of the St. Miguel Febres Cordero Research Award (2012-2013); an Outstanding Teacher, College of Business and Economics (1993-1994); a two time awardee of the Students' Search for Outstanding Teachers (1994 and 1995); and a member of the Dr. Jose Rizal Honor Society, an honor society of DLSU graduates. For his active research involvement, he was also awarded the following chairs: All Asia Capital and Leasing Corporation Professorial Chair in Investment Banking (2009 to present), Don Santiago Syjuco Professorial Chair in Economics (1985 to 2008), and the Bro. Vincenzo de la Croce Professorial Chair in Business Economics (1983 to 1985).

In 2014, he was appointed as part-time senior consultant at the China-ASEAN Research Institute of Guangxi University, China. A senior



FEATURED RESEARCHER

research fellow of the Yuchengco Center, Jun also served as Visiting Research Fellow at Waseda University's Institute of Social Sciences (April 1995) and at the UNESCO International Institute for Educational Planning. He was visiting professor at the Institute for International Studies and Training in Japan (October 1989 to January 1990), Shanghai University of Finance and Economics in Shanghai in the People's Republic of China (February to June 1987), Ohio University in the United States of America (April to June 1985, and Waseda University in Japan (May 1984).

He was a recipient of a Dissertation Fellowship at the Fletcher School of Law and Diplomacy from the Ford Foundation International Economics Program (1980 to 1982), Academic Scholarship from the same school (1978 to 1982), a Ford Foundation Fellowship at Stanford University (1973 to 1974) and a Fellowship and Entrance Scholarship at the University of the Philippines School of Economics (1973).

Jun is widely-published. He has produced more than 100 textbooks, monographs, and research articles on economic development, economics of education, and international economic relations, among others. He was among the country's pioneers in producing textbooks and reference materials that promote the use of Filipino in Economics subjects, which include: *Dictionary of Economic Terms in Pilipino* (1977) published by DLSU Economics Research Bureau; *Diksyunaryo sa Ekonomiks, Ingles – Filipino* (1990) and *Unawain Natin ang Ekonomiks sa Diwang Pilipino* (1990 and 1998, revised edition) both published by the Phoenix Publishing House (PPH); *Tungo sa Patakarang Industriyal ng Pilipinas* (1993) published by DLSU Press; *Mga Prinsipyo sa Ekonomiks* (1996) and *Diksyunaryo sa Ekonomiks, Ingles-Filipino* (2008) also published by PPH; and *Ekonomiya, Tao, Mundo, at ang Ekonomistang Guro* (2002) published by the De La Salle University Press. His two most recent books are *25 Taon Tungo sa Intelektwalisasyon ng Filipino*, *25 Piling Sanaysay sa Ekonomiks* (2012) published by De La Salle University Publishing House and *100 TAON ng Pamantasan, 100 TAO sa Nakaraan, 100 Haiku* (2011) Centennial Publication of De La Salle University.

Jun, who is the current director of the Angelo King Institute for Economics and Business Studies, also served DLSU in various administrative posts as chair of the Economics Department (1984 to 1997) and dean of the College of Business and Economics (1997 to 2001).

Despite having his hands full with teaching, administrative, and research responsibilities, Jun also makes time to share his expertise with other schools, affiliates, and organizations upon their request. He had conducted workshops and given lectures on various topics, including career enhancement, challenges confronting teachers in the modern world, teacher-tested ways to make class more fun and interesting, problems in the international responses to climate change, economic implications of the proposed basic education program K+12, as well as economic and demographic factors affecting school participation among children in urban and rural households. As president (1996 to 2001 and 2004 to present) and general manager (March 2013 to February 2014) of the DLSU Credit Cooperative, he has steered the organization to great heights.

Jun earned his Ph.D. in International Economic Relations and MA in Law and Diplomacy from the Fletcher School of Law and Diplomacy, Tufts University in Massachusetts, USA. He also holds an MA in Development Education from Stanford University in California, USA. He earned his AB degree in Economics *summa cum laude* from DLSU.

TIN OXIDE-SILVER COMPOSITE NANOMATERIAL COATING FOR UV PROTECTION AND ITS BACTERICIDAL EFFECT ON *ESCHERICHIA COLI*©

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Atsushi Iwamae ■ Kohji Yamamoto ■ Masahiko Tani

Introduction

The science and technology of protecting people against the harmful effects of ultraviolet (UV) radiation has received increasing interest in the recent decades, especially in countries with tropical climate where incidences of heat wave tend to occur [1]. UV radiation in the wavelength range of 280nm to 320nm, referred to as UVB, is harmful to the human skin. It causes sunburn, stains, or even skin cancer [2], while UV radiation of wavelength 320nm to 400 nm, referred to as UVA, causes skin aging, and wrinkling (photoaging). Unlike UVB which is absorbed by the epidermis [3], UVA causes photocarcinogenesis due to its ability to penetrate dermal layers.

To protect people from UV rays, tinted glass windows have been the most commonly used materials in buildings and vehicles. However, as the law prohibits the use of tinted windows, especially in vehicles, because of their increased use in criminal activities [4] [5] [6] [7], scientists have seen the need to develop glass that is not tinted yet capable of allowing just enough light to pass through.



The **Center for Natural Sciences and Ecological Research (CENSER)** is the research arm of the College of Science (COS). It is tasked to host externally funded research projects of the COS faculty by providing them basic administrative and clerical services and to maintain shared research laboratories/facilities with them and their apprentices. Since 2001, the CENSER has operated with five research units: Alfred Shields Marine Station (SMS), Molecular Science Unit (MSU), High Performance Computing Lab (HPCL), Biodiversity Unit (BU), and Materials Science and Nanotechnology Unit (MSNU). The SMS, MSU, and HPCL maintain shared facilities with a common pool of equipment essential to their research areas.

This research team fabricated tin oxide (SnO_2) nanomaterials, silver (Ag) nanomaterials, and tin oxide-silver (SnO_2 -Ag) composite nanomaterials. Thereafter, the toxicity of the nanomaterials to *E. Coli* bacteria was tested. The nanomaterials were then coated on glass slides, and the ability of the coated glass slides to block UVA was observed.

This study particularly focused on untinted glass materials typically used in windows. It specifically looked into how these glass materials could become a fertile ground for the growth and multiplication of microorganisms, which could cause, among others, stains [8], unacceptable odor [9], and hazards to human health [10]. The chemical constituents absorbed and deposited on glass windows actually provide nutrition to microorganisms, thereby promoting their growth [11]. To protect the health of the people, therefore, the researchers saw the importance of developing glass or glass coating materials that would possess antimicrobial properties.

Experimental phase

Preparation of Nanoparticles

The researchers used the following raw materials for the study: Ag powder of 99.99% purity and <45 microns grain size obtained from Sigma Aldrich and SnO_2 powder of 99% purity and <5microns grain size obtained from Merck. They employed the Horizontal Vapor Phase Crystal Growth Technique (HVPG) in fabricating the Ag, SnO_2 , and SnO_2 -Ag composite nanomaterials. They placed 35 milligrams of Ag powder, SnO_2 powder, and mixtures of SnO_2 and Ag powders at 1:4, 2:3, 3:2, and 4:1 ratio by mass in clean closed-end quartz tubes with inner diameter of 8.5 mm, outer diameter of 11 mm, and length of 220 mm. The quartz tubes were then evacuated with the use of

the Thermionics High Vacuum System up to a pressure of 10^{-6} Torr and were fully sealed by annealing. The sealed quartz tubes were then placed in a Thermolyne horizontal tube furnace and baked at a temperature of 800°C with growth time of six hours and ramp time of 80 minutes.

The tips of the tubes to be used for the antibacterial test were mechanically broken off with the use of a metal rod. The opened tubes were then emptied of glass shards by putting them upside down on a test tube rack. Bacterial solutions were later introduced into the said opened tubes for the antimicrobial test.

For the UVA test, the nanomaterials were first retrieved from the quartz tubes. The retrieval was done by a mechanical cracking of the tubes with the use of a bench vise. The grown nanomaterials were then scraped off the inner surface of the cracked quartz tubes.

Characterization of Nanoparticles

The surface and elemental analysis of the Ag, SnO_2 , and SnO_2 -Ag composite nanomaterials were done with the use of a JEOL SEM 5310 scanning electron microscope and an Oxford EDX System, respectively. The pour-plate technique was then used to confirm the antimicrobial properties of the nanomaterials. Employing this technique, *E. coli* bacterial solutions of 10^{-4} dilution factor were prepared through serial dilution from 0.5 Macfarland based standard solution. Two millimeters of the said solutions was then poured into six opened quartz tubes. One quartz tube contained Ag nanomaterials, another quartz tube contained SnO_2 nanomaterials, and the remaining four tubes contained SnO_2 -Ag nanomaterials of varying ratios of 1:4, 2:3, 3:2, and 4:1. Two additional quartz tubes were used. One contained Ag powder and the other contained SnO_2 powder. The researchers then shook the quartz tubes containing the bacterial solutions. One hundred microliters of the bacterial

solution from each quartz tube was poured in separate sterile petri dishes. Nine ml of sterile and cold nutrient agar medium was then poured into each petri dish containing the bacterial solutions. The contents were thoroughly mixed and allowed to solidify. The dishes were then incubated at 35 °C for 24 hours before a comparison of the colonies grown on each petri dish was made.

Characterization of Coatings

The coatings were prepared by mixing 1mg of Ag nanomaterials, SnO₂ nanomaterials, SnO₂-Ag composite nanomaterials, Ag powder, and SnO₂ powder with 3 ml of laminating fluid. The said mixtures were then coated onto glass substrates using the drip method. The UV optical properties of the samples were examined by means of the PASCO UV light

sensor in conjunction with an OMNI PAR 38 Flood 120W lamp light source.

Result and Discussion

Surface Morphology and Elemental Composition of the Grown Nanomaterials

Figure 1 shows the SEM images of (a) silver, (b) tin oxide, and (c, d) silver tin oxide nanomaterials grown at 800 °C with growth time of six hours. The micrographs reveal the presence of nanoparticles, wires, and cotton-like structures grown in random directions.

Table 1 exhibits the elemental (percentage by weight) and the atomic (percentage by the number of atoms) compositions of the SnO₂-Ag composite nanomaterials at (a) 1:4 ratio, (b) 2:3 ratio, (c) 3:2 ratio, and (d) 4:1 ratio.

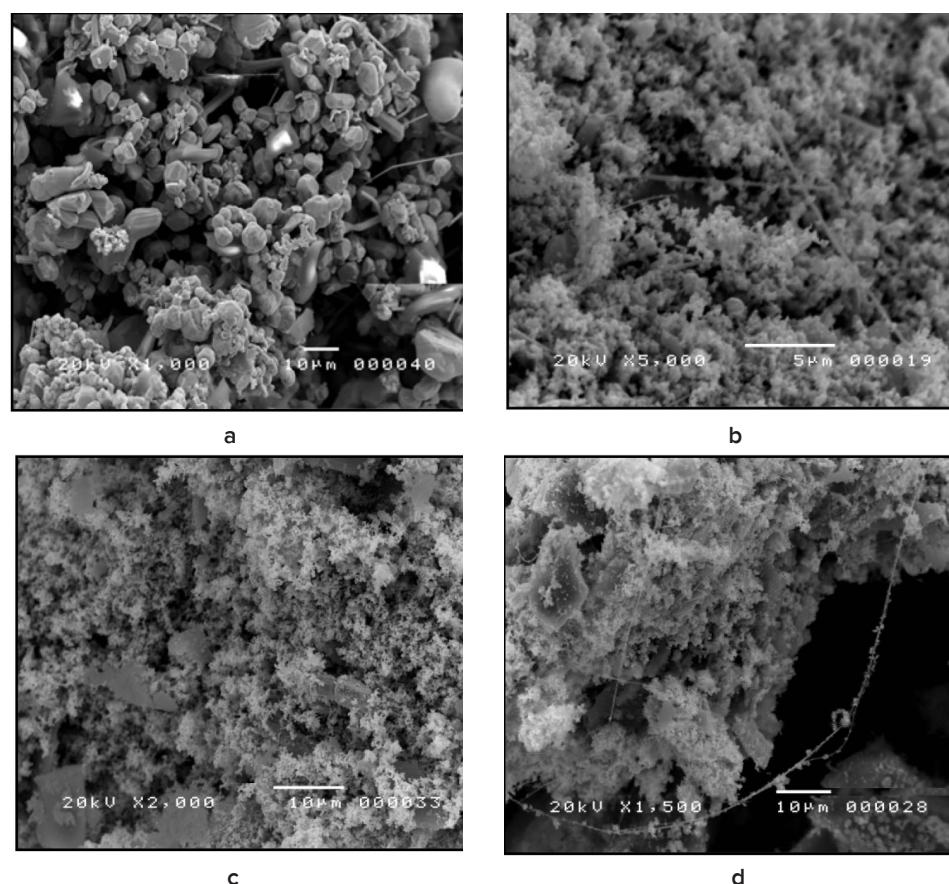


Figure 1. Scanning electron materials: (a) silver, (b) tin oxide, and (c, d) silver tin oxide

Table 1 Energy Dispersive X-ray (EDX) Analysis of SnO ₂ -Ag Nanomaterials			
(a) 1:4 mixture, (b) 2:3 mixture, (c) 3:2 mixture, and (d) 4:1 mixture			
1:4 Mixture SnO ₂ -Ag			
Element	Elem%	Atom%	
O	24.75	69.70	
Ag	45.84	19.14	
Sn	29.71	11.16	
Total	100.00	100.00	
2: 3 Mixture SnO ₂ -Ag			
Element	Elem%	Atom%	
O	34.00	78.94	
Ag	20.27	4.37	
Sn	45.73	16.69	
Total	100.00	100.00	
3:2 Mixture SnO ₂ -Ag			
Element	Elem%	Atom%	
O	36.30	84.75	
Ag	10.38	3.18	
Sn	53.32	12.06	
Total	100.00	100.00	
4:1 Mixture SnO ₂ -Ag			
Element	Elem%	Atom%	
O	20.83	66.02	
Ag	3.59	1.69	
Sn	75.58	32.29	
Total	100.00	100.00	

The resulting elemental and atomic compositions confirmed the presence of Ag, Sn, and O in the composite nanomaterials.

Antimicrobial Activity

For the purpose of comparison, two controls were set as shown in Fig. 2a and Fig. 2b. Fig.2a shows an agar plate without any bacterial colony. Only water, instead of a bacterial solution, was poured into the sterile petri dish. On the other hand, Fig. 2b shows an agar plate with several bacterial colonies seen here as several tiny white spots. The said colonies were formed by the introduction of a bacterial solution that had not been exposed to Ag nanomaterials, SnO₂ nanomaterials, or SnO₂-Ag composite nanomaterials.

In Figure 3, there are fewer colony forming units (CFUs) on the agar plate with Ag nanomaterials than on the agar plate with the bulk Ag powder. There are also fewer CFUs on the agar plate with the SnO₂ nanomaterials than on the agar plate with the bulk SnO₂ powder. This observation is consistent with a previous literature [12] that asserted that the antimicrobial property of bulk material was

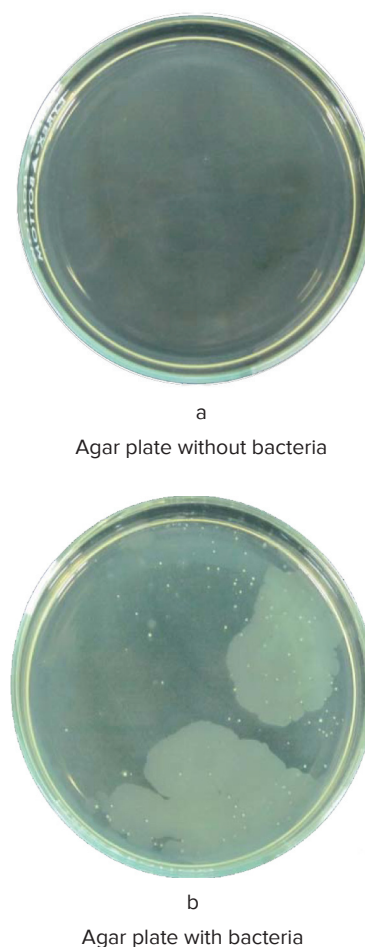


Figure 2. Agar plates used as control for comparison

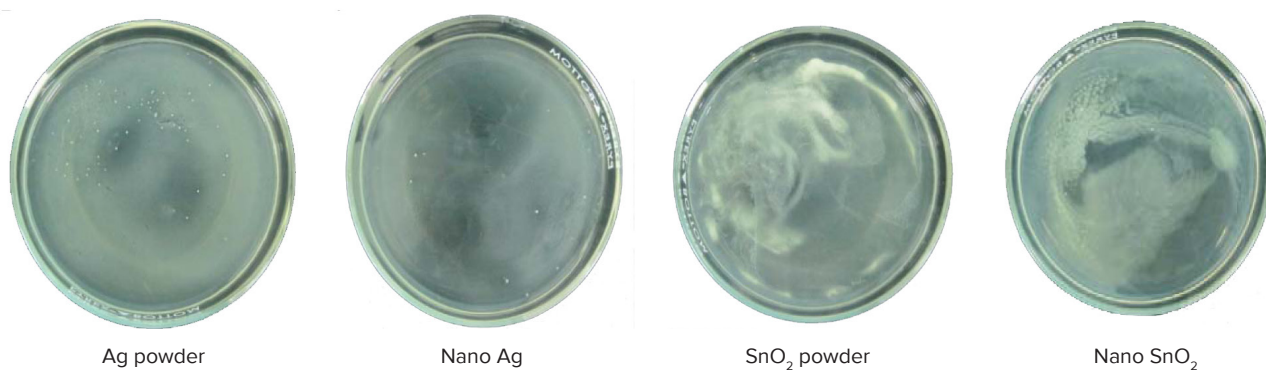


Figure 3. Comparison of colony forming units or CFUs with Ag powder and CFUs with nanomaterial on Ag and tin oxide

not only carried over but also enhanced by the nanomaterial counterpart.

Figure 4 shows that there are fewer CFUs on the agar plate with the 1:4 ratio of SnO_2 -Ag composite nanomaterials than those on the

agar plate with the 2:3, 3:2, and 4:1 ratios of SnO_2 -Ag composite nanomaterials.

Table 2 summarizes the results of the antibacterial test. It shows the CFU numbers after 24 hours of incubation. As has been

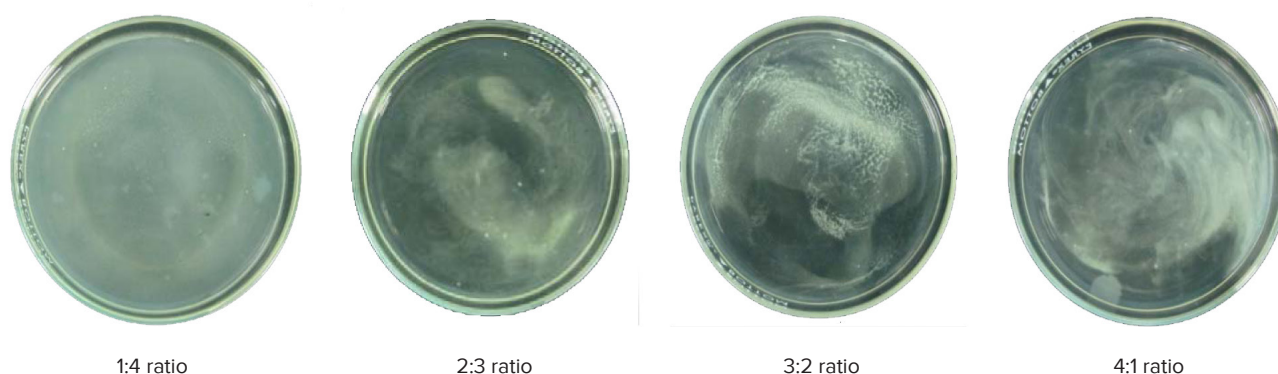


Figure 4. Agar plates containing the mixture of bacterial solution and nanomaterials of different ratio

Table 2 Colony Forming Units (CFU) vs. Material Composition									
Material	Ag powder	Ag nanomaterial	SnO_2 powder	SnO_2 nanomaterial	1:4 ratio	2:3 ratio	3:2 ratio	4:1 ratio	E. Coli.
CFU	59	18	500	35	9	19	20	31	149

observed before, Ag is more toxic to *E. coli* than SnO_2 and the nanomaterials are more toxic than their bulk form. Also, as the percentage of silver powder increases over tin oxide powder, the CFU number decreases. The same table reveals that the 1:4 ratio of tin oxide and silver exhibits the greatest antimicrobial effect on the other ratios and material composition. This finding is consistent with earlier reports [13] [14] stating that the combination of Ag and a metal oxide led to an increase in bactericidal effect.

The mechanism of the bactericidal effect of silver and silver nano-particles (NPs) is discussed in different studies [15]. Several studies propose that silver NPs can be attached to the surface of the cell membrane disturbing the permeability and respiration functions of the cell [10]. Smaller silver NPs, having a large surface area available for interaction, would be more bactericidal than the larger silver NPs [16]. Moreover, silver NPs may not only interact

with the surface of the membrane but also penetrate the bacteria [17].

UVA Analysis of the Samples

The UVA transmission measurement was done in four steps. One milligram each of Ag nanomaterials, SnO_2 nanomaterials, SnO_2 -Ag composite nanomaterials, Ag powder, and SnO_2 powder was first mixed with 3 ml of laminating fluid. The mixtures were then coated onto glass substrates using the drip method. Next, the coated glass slides were air dried. Finally, after drying, the slides were exposed to an OMNI PAR 38 Flood 120W lamp light source.

As Figure 5 shows, with the use of a PASCO light sensor and a Data Studio real time graph, the UVA light intensity was reduced by some amount when the glass substrate was coated. The glass coated with SnO_2 bulk powder, followed by the glass coated with Ag bulk powder, had the lowest UVA intensity.

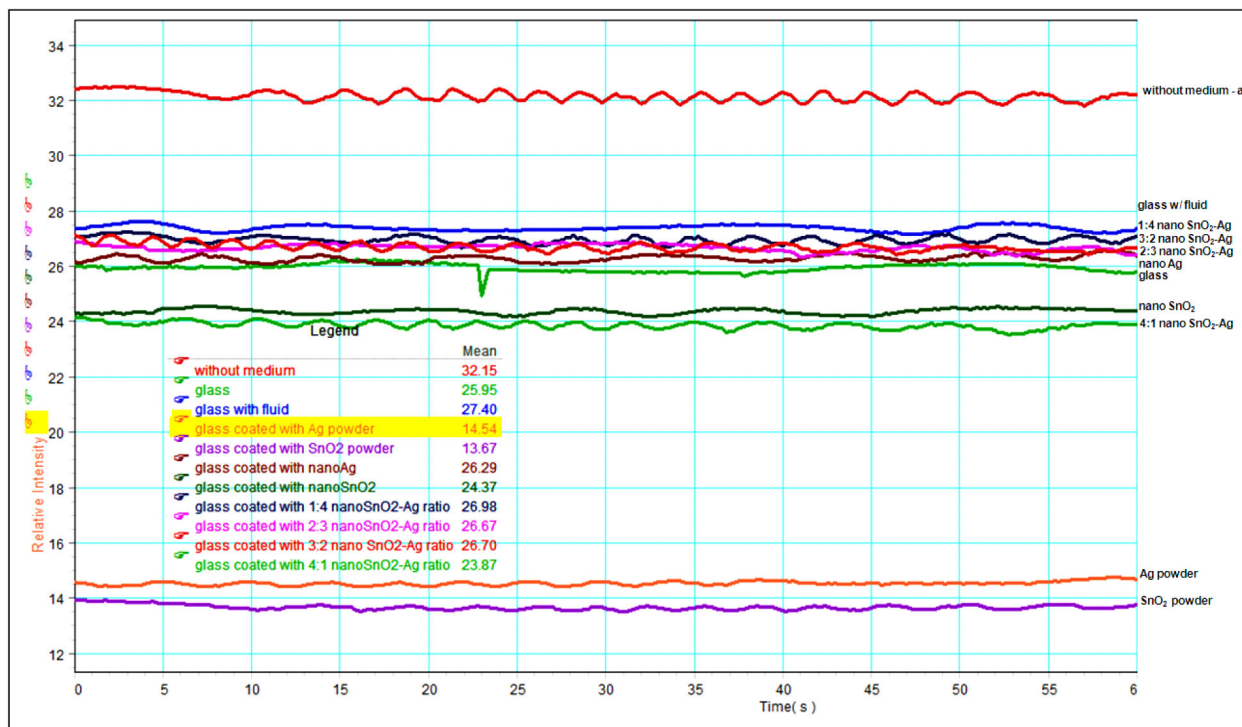


Figure 5. Graph of relative intensity of UV vs. time of different materials in powder and in nanoform..

These glass substrates were indeed a little opaque, as compared with the other coated glass substrates. On the other hand, among the glass substrates coated with nanomaterials, the glass coated with the 4:1 ratio of SnO₂ and Ag nanomaterials showed the lowest transmitted UVA, compared with the glass substrates coated with the 2:3, 3:2, and 4:1 ratios of SnO₂-Ag nanomaterials.

Conclusions

The HVPG technique was found effective in synthesizing silver and tin oxide nanomaterials. With the use of SEM and EDX analyses, the developed nanoproducts were seen as well characterized using SEM and EDX analyses. The antimicrobial test showed that the 1:4 ratio of SnO₂ and Ag nanomaterials had the greatest toxicity to *E. Coli* bacteria, compared with the 2:3, 3:2, and 4:1 ratios of SnO₂-Ag nanomaterials. On the other hand, the glass substrate coated with SnO₂ bulk powder showed the lowest intensity of transmitted UVA.

Acknowledgments

The research team would like to thank the Department of Science and Technology Philippine Council for Industry, Energy and Emerging Technology Research and Development for the research grant; Prof. Masanori Hangyo and Dr. Keisuki Takano for the far infrared to mid-IR FT-IR measurements conducted in their lab at the Institute of Laser Engineering, Osaka University, Japan; and Dr. Norio Miyoshi for his invaluable help for the near-IR FT-IR measurements conducted in his lab at the Faculty of Medical Sciences, University of Fukui, Japan.

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THE TALIM BAY MANGROVE REFORESTATION PROJECT

Dr. Maricar S. Samson

Introduction

Mangroves play a very important role in the ecosystem and the economy of a community. They are known to usually grow where no other species of trees can. Their thick and intricate root systems that are submerged in water function as filters that trap sediments that flow down rivers. These root systems help stabilize the coastline by preventing soil erosion that may be caused by waves, storms or heavy rainfall, and protecting coral reefs and seagrass meadows from being smothered in sediments. They are also crucial to the environment in that the impact of storms and typhoons in areas where mangrove forests are present are less severe.

The roots of mangroves serve as home to a large variety of fish, crustacean, and mollusc species which are essential sources of food and livelihood for thousands of coastal communities and residents. They are conducive for the shelter, as well as the safe development and growth of young fish and other marine species.

Mangrove is a valuable wood because it is resistant to rot and insects. Coastal communities use this wood for construction



The Br. Alfred Shields FSC Marine Station (SMS), is an academic facility operated by the Br. Alfred Shields FSC Ocean Research (or ShORE) Center intended to support field classes, along with research and extension activities in coastal areas. Located on a one-hectare parcel of land in Sitio Matuod, Binubusan, Lian, Batangas, the Marine Station has the following basic laboratory and field research equipment and facilities: a dry laboratory; a reference collection of common marine organisms; computers and various communication and video equipment; a small outrigger boat, SCUBA diving gear, tanks, and a compressor; basic housing facilities for faculty and students, including a small kitchen, 10-bed dormitory rooms, and freshwater supply from a deep well; and a generator for emergency power. It has been used by faculty and students of DLSU's Biology and Chemistry Departments as well as other universities.

material and fuel. Mangrove leaves are also used for animal feed. In recent years, mangrove forests have been commercially harvested for pulp, wood chip, and charcoal production. Moreover, because of the rich biodiversity in these mangrove forests and their general proximity to coral reefs and sandy beaches, many countries have already tapped into their tourism potential.

The first three quarters of the century have witnessed the massive deforestation of Philippine mangroves. While several mitigating projects were implemented in response to this rapid decline in mangrove forests, a significant area of the original forests has not been restored to date. Certain efforts have mainly been vast afforestation, a process of planting mangrove species especially on areas not previously forested.

The recent decades have witnessed an intensified effort to restore lost mangroves in the country. Studies have been undertaken to evaluate the outcomes of such efforts and to draw valuable lessons to help formulate

strategies in mangrove forest management. One such study, entitled “Growth Performance of Planted Mangroves in the Philippines: Revisiting Forest Management Strategies,” was undertaken in 2008 by Dr. Maricar S. Samson and Dr. Rene N. Rollon. It is a synthesis of research projects that assess the performance of planted mangroves across the country. The study revealed that there remains a widespread tendency to plant mangroves in areas that are not the natural habitat of mangroves, such as converting mudflats, sandflats, and seagrass meadows into monospecific *Rhizophora* mangrove forests. High mortality was experienced in these non-mangrove areas, and the few that survived had “dismally stunted growths” relative to the same species that thrive at high intertidal position and natural mangrove sites. The study concluded that a successful outcome is possible if the mangrove reforestation efforts would focus on replanting mangroves in the brackish-water aquaculture pond environments, which are the original habitats of mangroves.



Partners from the Globe Telecom Incorporated during the mangrove planting in June 2013 in Lemery, Batangas.

The Project Site

The current state of mangroves and brackish water pond areas in the Philippines is well exemplified in Talim Bay, Lian, Batangas. Talim Bay covers some eight (8) kilometres of coastline which includes around 830 hectares of coastal waters, around 110 hectares of coral reefs, about 178 hectares of seagrass meadows, and 30 hectares of remaining mangrove forests.

Talim Bay is situated along the eastern rim of Verde Island Passage that has recently been declared as the major center of marine biodiversity. It has barely 36% of its original mangrove vegetation and is dominated mainly by *Avicennia*, *Sonneratia*, and *Rhizophora* species. The remaining areas of the Bay have been used as aquaculture ponds (53%), with about 36 hectares apparently unused or underutilized. Recognizing the need to restore the ecological and economic values of these converted and degraded mangrove areas, DLSU and Globe Telecom Incorporated (GTI) have embarked on a joint project, entitled "Talim Bay Mangrove Reforestation Project," in 2010. The project is one of the several efforts of several entities aimed to address the need to reforest mangrove areas in the country.

The Joint Project

Mangrove reforestation requires millions of pesos in terms of investment because it involves costly propagation and maintenance of seedlings and transplantation into identified sites; research to identify soil quality and ecological characteristics of prospective reforestation sites, such as elevation patterns as well as the site's season for at least three years; the species of mangrove suitable to the sites, and their age/height which determine their degree of survival at the different

sites identified. Recognizing the need for a more comprehensive and long-term plan for its reforestation project, the Shields Marine Station, through the leadership of Dr. Wilfredo Licuanan, sought the help of various institutions to support the ongoing initiatives of SMS in terms of technical and financial assistance. In response, the GTI provided a modest amount for the Talim Bay Mangrove Reforestation Project. The project specifically aimed to reforest mangrove areas in Talim Bay, as well as to establish and sustain a mangrove nursery that could provide seedlings for the reforestation projects of Talim Bay and its adjacent municipalities.

Drawing valuable lessons from the reforestation efforts of past decades cited in earlier studies and from the experience of ShORE, DLSU and GTI initiated their joint long-term project in 2010, with DLSU taking charge of establishing and sustaining the mangrove nursery, leading and mobilizing groups to participate in the reforestation activities, and educating stakeholders on the importance of coastal management, particularly the care of mangrove forests.



DLSU Integrated School students during the mangrove planting in Oct. 2014

Establishment of the Nursery along with the Collection and Maintenance of Seedlings.

As an initial activity, reforestation sites and sources of seedlings were identified in the Bay. The four reforestation sites identified were: Roces, Ligtasin, Luyahan; Carbonan, Binubusan; Kay Reyna, Lumaniag; and Lumaniag proper. These sites are all located in the municipality of Lian, Batangas. Meanwhile, the identified major sources of seedlings were the Roces and Carbonan areas.

The first year of the project focused on the establishment of the mangrove nursery. Students from the Environmental Biology course of DLSU and other groups, including employees of GTI, assisted in the collection and bagging of seedlings. Seedlings were preferred over older mangroves because of the greater success of rearing them inside the nursery. A nursery staff was hired to collect and monitor the growth of the seedlings.

The species that were propagated in the nursery were *Avicennia marina*, *Ceriops decandra*, and *Sonneratia alba*. *A. marina* and *S. alba* are very important in coastal protection, but they are very hard to propagate and transplant in the target areas. Unlike the *Rhizophora* species, which can be directly planted in target areas, the two need at least 12 to 18 months of rearing inside the nursery before transplanting. For this reason, the project invested in the propagation of *A. marina* and *S. alba*.

Reforestation Activities. Sapling is the stage that follows the seedling stage. Learning from the work of Dr. Jurgenne H. Primavera in the Visayas, certain criteria must be met to improve the survival rate of seedlings/saplings in the wild. Thus, the seedlings/saplings selected for transplantation in this project were more than one year old, at least one meter in height, and already had branches. It was observed that survival rates of the saplings ranged between 80% to 90%.

In AY 2012-2013, transplantation activities were conducted by a class of Environmental Biology students and some alumni from DLSU, DLSU Sea Scouts, and GTI employees. Faculty members of the DLSU Integrated School also participated in the mangrove planting at Sitio Carbonan, Binubusan, Lian, Batangas. A total of 1,350 seedlings were transplanted in 2012, 1,300 of which were planted in the Talim Bay area.

The reforestation of adjacent municipalities of Lian was also started, particularly the mangrove planting site in Barangay Palanas, Lemery Batangas. The Municipal Environment and Natural Resources Office (MENRO) of Lemery forged an agreement with the operators of idle fishponds and mudflat areas in Barangay Palanas. By virtue of the agreement, it was able to present the opportunities for transforming these idle areas into an ecotourism zone. The first step towards converting the area into such a zone was the reforestation of idle ponds.

Seedling Donation. Seedlings which had grown to a height of 0.5 meters and with one or two branches were donated to various organizations for their mangrove reforestation activities. These criteria were chosen to ensure that the seedlings that will be transplanted would have higher chances of surviving wind, wave, debris entanglement, and drowning.

A number of seedlings were also donated to the mangrove rehabilitation efforts of the nearby barangay within Talim Bay in collaboration with the King Fisher's Organization.

Other Related Activities. Based on the learnings drawn from the establishment and maintenance of the nursery and the transplantation activities, Dr. Samson also gave a lecture to the College Student Council of DLSU-STC. She imparted the proper ways of maintaining nurseries and transplanting seedlings.

Future Prospects

Mangrove reforestation greatly depends on the political will of the national and local government along with the sustained commitment and involvement of the community and concerned sectors of society, especially the academe and industry. In light of these, DLSU and GTI have partnered not only to embark on actual mangrove reforestation activities but also to educate coastal residents around Talim Bay; faculty, students, staff, and alumni of DLSU; and GTI employees on proper coastal management and foster awareness on the importance of mangrove systems.

Part of the initiatives of the DLSU and GTI partnership is to provide assistance to the local government unit (LGU) of Lemery, Batangas in reforesting the five (5) hectares of idle fishpond, which they started replanting

in 2012. Albeit indirectly, DLSU and GTI hope that through the network established with (LGUs), there would be improved cooperation between law enforcement agencies and communities to better monitor and protect the mangrove areas.

The project will also continue to reforest available denuded areas within Talim Bay, as well as monitor the areas which had been reforested for the past two years.

Finally, the project will take the following into consideration to increase the rate of survival of seedlings planted: schedule of planting activities vis-à-vis the site's tidal pattern; appropriate height of *A. marina* species that will be suitable for transplantation; and other species such as *Sonneratia alba*, *Ceriops sp.*, *Bruguiera sp.* that may be appropriate to the soil quality, geographic and ecological characteristic of the planting site.



DLSU Integrated School students during the monitoring of planted mangroves in Feb. 2013.

DE LA SALLE FOOD INSTITUTE

The **De La Salle Food Institute** is a consortium between the Lasallian institutions in the Philippines for the purpose of education, research, innovation and transfer of technology in the different areas of study along the food supply chain. The Institute is guided by the Lasallian mission of generating and propagating new knowledge for human development and social transformation. It seeks to serve the food supply chain requirements of the Philippines in particular and Southeast Asia in general and take advantage of the Philippines being one of the platforms of education in the region.

UNIVERSITY RESEARCH COORDINATION OFFICE (URCO)

Research@DLSU AY 2012-2013 basically puts together all the research projects done by faculty members in different colleges and research centers of the University that are managed by the Office of the Vice Chancellor for Research (OVCR) through the University Research Coordination Office (URCO). It also presents a comprehensive picture of research activities on campus by including the major initiatives of other departments and offices, which help sustain the momentum of research in the University and ensure that the results of the scholarly pursuits of faculty and students are properly disseminated.

Research in the University has remained relevant to the changing times; it is responsive to the challenges of the 21st Century and the imperatives of social transformation. DLSU has strongly encouraged inter- and multi-disciplinary scholarly pursuits, recognizing that the problems and issues confronting the nation, the region, and the global community can be addressed best by collaborative endeavors of experts from diverse disciplines. Its research has had an impact beyond the periphery of the University. It influences

policy reviews and formulations, introduces interventions to bridge the socio-economic divide and enable improvements in the quality of life, and provides viable solutions to the problems and issues that define the contemporary age.

Activities under the OVCR and the URCO

The URCO has continued to administer and monitor faculty projects from their approval for internal and external funding to their completion. The office has also continued to offer capability-building and research skills enhancement seminars and to provide venues for the dissemination of research findings.

Consistent with the University's Mission-Vision of being a resource of Church and nation, the research centers have forged partnerships with government and non-government organizations, civil society groups, and other institutions to undertake studies that will impact on the quality of life, alleviate the plight of the poor and marginalized sectors of society, and address the adverse impact of the global climate change phenomenon.

URCO-managed and Monitored Projects

In AY 2012-2013, the URCO administered 299 internally funded and 155 externally funded researches. Of these, 96 were newly approved, and 83 were completed within the academic year.

New projects. A total of 64 proposals for internal funding were approved. These proposals were for 31 Faculty Research Programs (FRP), 11 Special Project Grants (SPG), 14 Inter-disciplinary Research (IR) grants, and 8 Research Program Workshops (RPWs). The SPGs were six New PhD Grants, four Thesis & Dissertation Grants, and one Sabbatical Leave Project grant. The total approved budget for the 64 projects was PhP 8,044,794.25. The sources were the URCO (PhP2,037,078.13), the New PhD Grant (PhP 567,710), the DLSU Science Foundation (PhP608,240), the College Research Fund (PhP 260,597.12), the VC for Research Jump Start Funds (PhP 70,000), the IR Program (PhP2,901,169), and the RPWs budget (PhP 1,600,000).

Meanwhile, 32 new externally funded projects received an estimated total grant of PhP 134,964,315.19 (in various denominations). The funders were:

- AECOM Philippines Consultants, Corp.
- Angelo King Institute Community-Based Monitoring System
- ASEAN Secretariat under the ASEAN+3 Research Group
- Asian Institute of Technology
- Asia-Pacific Economic Cooperation
- Australian Agency for International Development
- Center for Budget and Policy Priorities
- Chamber of Mines of the Philippines
- Commission on Higher Education
- Department of Labor and Employment
- Department of Science (DOST) National Capital Region

- DOST Philippine Council for Industry
- Energy and Emerging Technology Research and Development
- Economic Research Institute for ASEAN and East Asia
- Engineering Research and Development for Technology
- Food and Agriculture Organization of the United Nations
- Ibanag Heritage Foundation, Inc.,
- National Academy of Sciences and the United States Agency for International Development (USAID)
- National Research Council of the Philippines
- Samahan sa Pilipinas ng mga Industriyang Kimika (SPIK or SEED)
- SN Aboitiz Power-Magat, Inc.
- Social Sciences and Humanities Research Council of the University of Columbia
- United Nations Industrial Development Organization
- Université Laval – DFID
- University of New South Wales
- USAID through the Virginia Polytechnic Institute and the North Carolina Agricultural and Technical State University
- Mr. Vicente L. Pacheco

Completed projects. Of the 83 projects that were completed within the academic year, 29 were internally funded under the URCO, and 54 were externally funded. Twenty six of them were on sustainability, the environment, and energy. Thirty five were on living culture and contemporary societies; nine were on learners and learning innovations; six were on food, nutrition, and health; and seven were on women, children, and family.

Challenge grants. The Challenge Grant program offers faculty members of diverse

research backgrounds a venue to work together to address research themes. In AY 2012-2013, three Challenge Grant proposals were approved with a total funding of P2,924,664. They were on three challenging topics: “Influencing Agricultural Policy and Farm Practices Based on Scientific Investigation of Determining Antibiotic Residues in Meat Tissues from Pork, Chicken, Freshwater Aquaculture Products, and Eggs,” “Development of a Calibrated Multiple-Objective Linear Programming Inoperability Input-Output Model for Disaster Risk Management in the Philippines,” and “The Development of a Technology Transfer Model for the DLSU Micro-Hydro Power Plant (MHP) System Technology at Barangay Parina, Apayao for Socio-Economic Sustainability and Inclusive Development.”

Interdisciplinary research. Fourteen Interdisciplinary Research projects were approved with a total funding of P2,901,169. Among these were those that examined the manual and the NLP-supported discourse analyses of Twitter-based comments on the May 2013 elections, parallel language resources, the meaning and the predictors of originality among Filipino social and natural scientists, the design and development of an underwater robot system, and the use of computer vision to control the water quality of tiger prawn aquaculture based on its behavioral patterns. The rest of the IR projects were: a modeling of the affect states of readers when reading a story; a linguistic phenomenological study of fair trade coffee farming experience in the Cordilleras; an investigation of climate change, land use efficiency, and flood production nexus in the Philippines; morphological and thickness analyses of spin-coated Nafion films; a research in the social sciences on issues of unfair practices; the isolation, structure elucidation, and genotoxicity assays of the chemical constituents and dichloromethane

extracts of six *Cycas* species; an investigation of airborne bacterial flora in the intensive care unit, operating room, emergency room, and nursery of the Ospital ng Muntinlupa; theoretical studies on quantum transport properties of boron nitride nanotubes; and a study on enhancing an embodied conversational agent with affective dialogue generation.

Partnerships and collaborations.

Through the different research centers, partnerships have been forged by the University with external organizations which are then able to tap DLSU’s research experts to undertake studies that would influence policy formulation and review and to assess the efficiency of mechanisms in the delivery of basic services to the needing sectors of society, among others. In AY 2012-2013, the University partnered with the following organizations for special projects:

- Food and Nutrition Research Institute for an impact assessment, profiling, and mapping of vulnerable households and policies relative to food insecurity resulting from climate change;
- *Centre interuniversitaire sur le risque, les politiques économiques et l’emploi* (CIRPÉE) of Laval University and Grupo de Analistas para el Desarrollo (GRADE), which are based in Peru, for studies on policy analysis for growth and employment;
- Institute for International Monetary Affairs of Japan, ASEAN+3 Research Group, and Association of Credit Rating Agencies in Asia (ACRAA) for a project that looked into credit rating agencies and the enhancement of infrastructure to strengthen the regional credit rating capacity in the ASEAN+3 region;
- National Economic Development Authority – Social Development Staff for the 2008 Community-based Monitoring

System-United Nations Development Programme (CBMS-UNDP) grants program and the monitoring of project operations and the impact of barangay-based poverty reduction programs funded by the CBMS-UNDP Development grants program;

- Polytechnic University of the Philippines, Philippine National University, Emilio Aguinaldo College, La Consolacion College, and Knowledge Community, Inc. for their graduate tracer studies;
- Dr. Joost R. Santos external collaborators and George Washington University in the US for a study on the development of inoperability input-output model for the Philippines;
- Tokyo Institute of Technology for a sustainability assessment of bioethanol and biodiesel in the Philippines and Vietnam;
- Overseas Workers Welfare Administration for a project on e-governance services for overseas Filipino workers;
- Laguna Lake Development Authority for a study on urbanizing watersheds; Department of Interior and Local Government (DILG) and Taguig, Laguna, and Siquijor local governments for a rapid assessment of the PCF program for Local Government Units (LGUs);
- Silliman University and University of San Carlos for a project on

institutionalizing civil society monitoring and assessment of public service delivery to the poor;

- DILG for studies on the transparency and accountability mechanisms of local governance in the Philippines and mechanisms for promoting transparency and accountability.

Research program workshops.

Recognizing the research excellence and productivity of the academic community, the URCO provides funds for research program workshops that are facilitated by a team of faculty from the different colleges. The two-year old RPW reinforces the University's mission "to serve as a leading resource in natural, social and human sciences." Seven workshops were held in AY 2012-2013. Among these were those on "Human Rights in the ASEAN Region" under the College of Law, "Food Security in the Philippines" under the Gokongwei College of Engineering, and "The Young and the Sacred: On Filipino Youth's Sacred Experiences, Sacred Performances and Notions of the Sacred" under the College of Liberal Arts.

Research dissemination. The findings of research studies are only as good as their ability to reach and benefit the stakeholders. The OVCR and the URCO organize symposiums and lectures to disseminate such findings, so that valuable insights can be drawn from completed projects. In AY 2012-2013, the following symposiums/lectures were held:

Symposiums and Lectures on Interdisciplinary Research Projects

Title	Delivered by	Date
“Building a Multimodal Laughter Database for Emotion Recognition”	<p>Project Leader: Dr. Merlin C. Suarez (Software Technology)</p> <p>Members: Dr. Madelene A. Sta. Maria (Psychology) and Jocelynn W.Cu (Computer Technology)</p> <p>Discussant: Dr. Kiet Troung (Post-Doctoral Researcher, Department of Human Media Interaction, University of Twente)</p>	August 6, 2012
“The Study of Microalgae Post-Cultivation Processes for Biofuel Production with Concentration on Biomass Drying”	<p>Project Leader - Dr. Alvin B. Culaba (Mechanical Engineering)</p> <p>Members: Aristotle T. Ubando (Mechanical Engineering), Dr. Raymond Girard R. Tan (Chemical Engineering), and Joel Q. Tanchuco (Economics)</p> <p>Discussants: Anthony B. Obligado (Head, Technology Commercialization Division, Bureau of Agricultural Research, Department of Agriculture), and Associate Professor Nerissa K. Torreta (Plant Biology Division, Institute of Biological Sciences, College of Arts and Sciences, University of the Philippines College, Laguna)</p>	October 27, 2012
“Waste Analysis and Characterization Study (WACS)”	<p>Norway J. Pangan (Ph.D. student, Chemical Engineering)</p> <p>Discussants: Dr. Mario P. De Leon (Civil Engineering), and Renato R. Ubay (Chairman of the Board and President, Alcanta-Ubay Co., Inc.)</p>	December 11, 2012
• “Structural Stability of Ferrocement Disposal Barge”	Irene Olivia Ubay-Anongphouth (Civil Engineering)	
• “Durability of Ferrocement Disposal Barge”	Cheryl Lyne Capiz-Roxas (Civil Engineering)	

Title	Delivered by	Date
“Measuring Academic Affective States of Students via Brainwave Signals”	<p>Project Leader: Rhia S. Trogo (Software Technology)</p> <p>Members: Adrienne John R. Galang, Rajiv K. Amarnani, and Anton Simon M. Palo (Psychology), and Dr. Merlin C. Suarez (Software Technology)</p> <p>Discussants: Paul B. Salvador Inventado (DLSU Software Technology) and Dr. Ma. Regina Justina E. Estuar (Ateneo de Manila University School of Science and Engineering)</p>	February 23, 2013
“A Preliminary Study on Bioleaching of Coal Ash: Leachability of Chromium form Coal Bottom Ash using Continuous Column Test”	<p>Project Leaders: Dr. Susan M. Gallardo and Denver C. Pangayao (Chemical Engineering)</p> <p>Discussants: Dr. Michael Angelo B. Promentilla (Chemical Engineering) and Petronilo R. Madrid (Vice President, Panay Power Corporation)</p>	April 3, 2013
<ul style="list-style-type: none"> • “Utilization of Coal Bottom Ash Concrete” 	Ronaldo S. Gallardo (Civil Engineering)	
<ul style="list-style-type: none"> • “Strength and Permeability Characteristics of Road Based Materials Blended with Fly Ash and Bottom Ash” 	Dr. Jonathan R. Dungca and Julie Ann L. Jao (Civil Engineering)	
<ul style="list-style-type: none"> • “Economic Implications of the Partial Substitution of Coal Fly Ash and Bottom Ash for Cement and Aggregate Construction Materials” 	Dr. Eppie E. Clark (Industrial Engineering)	

Capability-building and skills enhancement. The OVCR and the URCO also provide sessions to enhance the research

skills of the faculty and junior researchers. They held the following workshops in AY 2012-2013:

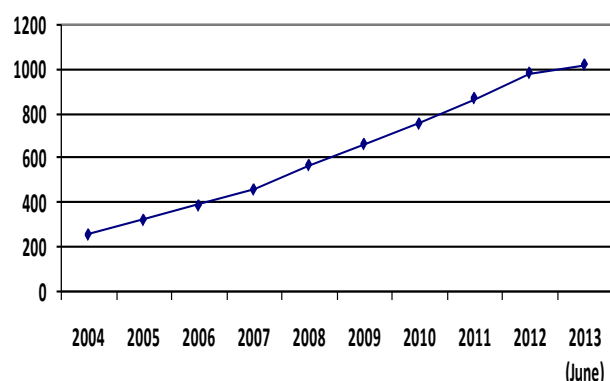
Capability-Building Seminars and Workshops

Title	Facilitator	Date
“Research Proposal Writing for Researchers in the Natural Sciences and Related Fields”	Dr. Gil Nonato C. Santos (Physics)	June 29, 2012
“Research Proposal Writing for Researchers in the Social Sciences”	Dr. Maricar S. Prudente (Science Education)	July 13, 2012
“Conceptualizing Research Projects in the Humanities”	Dr. Feorillo A. Demeterio III (Filipino)	July 27, 2012
“Conceptualizing Research Projects in the Humanities”	Dr. Feorillo A. Demeterio III (Filipino)	October 12, 2012
“Research Proposal Writing for Researchers in the Social Sciences”	Prof. Adrianne John R. Galang (Psychology)	November 9, 2012
“Publishing Research Papers in High Impact Journals in the Social Sciences”	Dr. Maricar S. Prudente (Science Education)	November 23, 2012
“Mula Konsepto Hanggang Ganap na Proyekto: Mga Hakbang sa Pagpapanukala ng Malikhaing Akda”	Dr. Ernesto V. Carandang II (Filipino)	November 28, 2012
“Research Proposal Writing for Researchers in the Sciences and Related Fields”	Dr. Drexel H. Camacho (Chemistry)	January 24, 2013

Faculty involvement. In AY 2012-2013, 26.3% of the teaching and academic service faculty, or 307 out of a total of 1,167 faculty members, were actively involved in research. There was an increase in the involvement of junior faculty and graduate students in research since they were given opportunities to team up with senior faculty researchers for inter- and multi-disciplinary research projects.

Research productivity and quality indicators. Data from Scopus reveal that as of June 2013, the documents published by DLSU had crossed the 1,000 mark. The University registered an H-index of 29 with a citation count reaching 4,924 (excluding self-citations of all authors).

DLSU Research Productivity Statistics



DLSU Quality Indicators

	Citations Received since 1996	Citations Received since 1996 (Self citations of all authors are excluded)
Documents published from 1982 to June 2013	1,021	1,021
H-index	37	29
Citation Count	6,755	4,924

*Scopus does not have completed citation information for articles published before 1996.

Source: Scopus, June 2013

Major Activities Undertaken by Other Departments/Units

Research@DLSU AY 2012-2013 also captures some of the major initiatives of the other departments and offices that help sustain the momentum of research in the University.

STC Complex

The DLSU Science and Technology Complex (STC) was established by the Office of the

President and Chancellor. It serves as a key resource in the development of science and technology in the country.

DLSU Research Congress

The 2013 DLSU Research Congress was held on March 7 – 9, 2013. It was organized by the Office of the VCR in collaboration with the URCO, the different research centers, and the Research and Advanced Studies Directors. Its keynote speaker was 2010 Nobel Prize Winner in Chemistry Prof. Richard Heck, an adjunct professor of the DLSU Chemistry Department, who gave insights into his life as a scientist and researcher. Department of Energy Secretary Carlos Jericho L. Petilla and Dr. Rowena L. Guevara, DOST Philippine Council for Industry, Energy and Emerging Technology Research and Development Executive Director, discussed the research agenda and directions that the country was pursuing.

During the congress, recipients of the University's Challenge Grant introduced their research works, and representatives of the research centers briefed the participants on their research agenda, activities, and research outputs. Some PhD and MS/MA students also spoke of the initial results of their research activities before a panel of discussants.

Capping the activity was the URCO's Annual Faculty Research Recognition program. It honored 73 faculty members who had completed interdisciplinary and internally- and externally-funded projects in the April 1, 2012 – 15, 2013 period.

The maiden issue of *Questions*

The Strategic Communications Office, which is also under the Office of the President and Chancellor, launched *Questions*, a publication that features the research projects and creative endeavors of the DLSU faculty. The publication is distributed to local and international

research centers, colleges and universities, the ASEAN University Network, the International Association of Lasallian Universities, and government and industry partners.

Regional Conference on Research and innovation

The Center for Business Research and Development organized and hosted the 9th Asian Network for Learning, Innovations and Competence Building Systems (ASIALICS) International Conference on October 4-5, 2012. The conference had the theme “Innovation and Appropriate Technology for the Development and Inclusive Growth of Asian SMEs.” Joining the event were 60 scholars from Japan, Korea, Thailand, Malaysia, Hong Kong, Bangladesh, Germany, India, Estonia, and the Philippines.

Prospects for 2013-2014

Recognizing current needs and trends, the University will endeavor to be at the forefront of research, innovation, and knowledge transfer.

DLSU will continue to forge and strengthen collaborative partnerships with key sectors of society by offering the expertise needed to undertake baseline and assessment studies, exploring channels to deliver basic services to the target groups in society, and optimizing the use of and enhancing existing technologies.

Beyond encouraging its faculty to publish their works in high-impact journals and to apply for patent or copyright for their research or creative outputs, the University will embark on an intensified effort to determine the usability of its researches by putting in place mechanisms that can measure their positive effects on communities.

It will endeavor to benchmark DLSU's research projects with those of other high performing colleges and universities to ensure quality, relevance, responsiveness, and usability of research outputs.

LIST OF COMPLETED URCO-MANAGED INTERNALLY AND EXTERNALLY FUNDED PROJECTS

INTERNALLY FUNDED PROJECTS AY 2012-2013

PROPONENT/DEPARTMENT	PROJECT TITLE/NO.
FACULTY RESEARCH PROGRAM	
Dr. Cesar Rufino <i>Economics</i>	ASEAN+3 Currencies: Determining Long-run Linkages 40 F U 3 07
Mr. Danny Cheng <i>Software Technology</i>	Improving Application Visibility in a Mobile Application Store Through Social Network Integration 03 F U 1 10
Mr. Rafael Cabredo <i>Software Technology</i>	A Study on Emotion Detection in Music Using Rhythmic Content 27 F U 2 08
Mr. Ralph Vincent Regalado <i>Software Technology</i>	Building Web-based Filipino Language Learning Tool for Heritage Learners 20 F U 2 10
Dr. Rachel Editra Roxas <i>Software Technology</i>	Automatic Detection of Code-Switching Points 20 F U 2 11
Dr. Merlin Teodosia Suarez <i>Software Technology</i>	Human Affect Modeling Using Body Movement 21 F U 2 10
Ms. Jocelynn Cu <i>Computer Technology</i>	Modeling Spontaneous Affect Using Dimensional Labels The Filipino Multimodal Emotion Database annotated with dimensional labels (in CD) Face and Voice affect Models implemented in 2 software prototypes
Dr. Sterling Plata <i>DEAL</i>	Evaluation of the 2010 Secondary Education Curriculum (English) of the Philippines 34 F U 2 08
Dr. Alfredo Robles <i>International Studies</i>	EU Services Trade with ASEAN: Towards Policy Coherence for Development? 29 F U 2 10
Ms. Rica de los Reyes-Ancheta <i>TRED</i>	Beyond the Aporias of Ethics of Care and Agapic Ethics: Towards an Ethics Grounded in Florence Nightingale's Faith-Based Caring Practices 11 F U 1 11
Mr. Adrienne John Galang <i>Psychology</i>	The Rise and Fall of the Pacquiao Effect: Contrastive Priming and National Identification 31 F U 2 10
Dr. Rizal Buendia <i>Political Science</i>	Ethnopolitics in Muslim Secession in the Philippines 25 F U 2 11

PROPONENT/DEPARTMENT	PROJECT TITLE/NO.
Ms. Alma Maria Jennifer Gutierrez <i>Industrial Engineering</i>	Materials Development for Occupational Safety Course Part 2 (OCCSAFE) 46 M U 3 11
Dr. Laurence Gan Lim <i>Mechanical Engineering</i>	Classification of Colonic Mucosa Microscopic Images Using a Combination of Genetic Algorithms, Artificial Neural Networks, and Fuzzy Logic 04 F U 1 07
Ms. Jazmin Tangsoc <i>Industrial Engineering</i>	Materials Development Project for Health Care Management (Part 2) 49 M U 3 11
THESIS & DISSERTATION GRANT	
Dr. Jessie Saraza Barrot <i>DEAL</i>	Towards the Development and Validation of the Unified Materials Design Model for ESL Learners: A Sociocognitive Perspective 07 D U 1TAY12-3TAY12
Dr. Ron Resurreccion <i>Psychology</i>	From Devastation to Celebration: Reactions, Experiences, and Character Strengths of Fathers and Mothers of Children with Autism 32 D U 2 10
NEW PH.D. GRANT	
Dr. Kathleen Aviso <i>Chemical Engineering</i>	Development of Fuzzy Mathematical Programming Approach to the Design of Robust-Eco-Industrial Water Exchange Networks 27 N N/SF 2 10
Dr. Oscar Torres <i>Chemistry</i>	Molecular Identification of Microbial Aerosols Using Proteomics 17 N/S/C 1 11
SABBATICAL LEAVE PROJECT	
Mr. Rene Hapitan <i>Financial Mgmt.</i>	An Analysis of a Signaling Model of Corporate Philanthropy in Publicity Listed Banks 41 S U 3 06
Ms. Charibeth Cheng <i>Computer Technology</i>	Building an Annotated Corpus of Philippine Political Commentaries 38 S U 3 10
Dr. Isagani Jos <i>Mathematics</i>	The Spectra of the Cartesian Product of Some Special Classes of Digraphs 53 S U 3 04
GENERAL EDUCATION MODULES FOR TRANSFORMATIVE LEARNING	
Dr. Elizabeth Mascardo Ms. Melanie Juliano <i>Physical Education</i>	FWSPORTS (Swimming) 30 GE C 3 05
INTERDISCIPLINARY RESEARCH	
Dr. Merlin Teodosia Suarez Project Coordinator, ST CCS Project Team Members: Dr. Madelene Sta. Maria, Psychology CLA Ms. Jocelyn Cu, CT CCS	Investigating Emotions in Filipino Laughter 01 IR 2 09

PROPONENT/DEPARTMENT	PROJECT TITLE/NO.
<p>Ms. Rhia Trogo Project coordinator, ST CCS</p> <p>Project Team Members: Mr. Adrianne John Galang, Psychology CLA Mr. Rajiv Amarnani, Psychology Mr. Anton Simon Palo, Psychology</p>	<p>Recognizing Student Affect Using Brainwave Signals 04 IR S 2 10</p>
<p>Dr. Carlo Magno Proj. Coordinator, CEPD</p> <p>Project Team Members: Dr. Elizabeth Mascardo, PE Ms. Janet Mariano, PE</p>	<p>Testing the Invariance of the Dualistic Model of Passion for Group and Individual Sports Among Out of School Youth 06 IR 3 09</p>
<p>Engr. Ronaldo Gallardo Proj. Coordinator, CE</p> <p>Project Team Members: Ms. Irene Olivia Ubay, CE Dr. Susan Gallardo, Chem. Eng'g.</p>	<p>Structural Stability of Ferrocement Used in Garbage Barges 03 IR U 1 11</p>
<p>Engr. Ronaldo Gallardo Proj. Coordinator, CE</p> <p>Project Team Members: Dr. Nilo Bugtai, MEM Ms. Cheryl Lyn Capiz, CE Dr. Susan Gallardo, Chem. Eng'g.</p>	<p>Durability of Ferrocement Garbage Disposal Barge 02 IR U 1 11</p>
<p>Dr. Alvin Culaba Proj. Coordinator, ME</p> <p>Project Team Members: Dr. Raymond Tan, Chemical Engineering Dr. Joel Tanchuco, Economics Engr. Aristotle Ubando, Mechanical Engineering</p>	<p>The Study of the Microalgae Post-cultivation Processes for Biofuel Production with Concentration on Biomass Drying 10 IR S/C 3 10</p>
RESEARCH PROGRAM WORKSHOPS	
<p>Dr. Anna Bella Siriban-Manalang Dr. Ma. Carmen Ablan-Lagman Dr. Arlene Inocencio</p>	<p>Food Security in the Philippines 04 RPW AY12-13</p>

PROPONENT/DEPARTMENT	PROJECT TITLE/NO.
Dr. Jeane Peracullo Dr. Rito Baring Dr. Charmaine Misalucha	The Young and the Sacred: On Filipino Youth's Sacred Experiences, Sacred Performances and Notions of the Sacred 08 RPW AY12-13
Prof. Rosario Olivas-Gallo Prof. Jose Manuel Diokno Prof. Glenda Litong	Research Program Workshop in Human Rights in the ASEAN Region 06 RPW AY12-13

EXTERNALLY FUNDED PROJECTS AY 2012-2013

PROJECT DIRECTOR/ASSOCIATES	PROJECT TITLE	FUNDING AGENCY
CENTER FOR BUSINESS RESEARCH AND DEVELOPMENT/SCHOOL OF ECONOMICS		
Dr. Aida Velasco Dr. Emilina Sarreal Ms. Ma. Victoria Tibon Ms. Sally Siao	Reengineering Study of the operations of the Lasallian Study Center	Mr. Vicente Pacheco
Dr. Aida Velasco Dr. Maria Victoria Tibon Ms. Eula Bianca Villar	Proposed Philippine Chemical master plan 2012-2030	Samahan sa Pilipinas ng mga Industriyang Kimeka or SPEIK a SEED)
DLSU-ANGELO KING INSTITUTE		
Dr. Tereso Tullao, Jr. Dr. Michael Angelo Cortez Mr. Christopher James Cabuay <i>Economics</i>	Issues and Prospects on the Movement of Natural Persons and Temporary Migration in Philippine-European Union Partnership SOE AKI 2 L 3TA11-1TA12	PIDS
Dr. Tereso Tullao, Jr., Dr. John Paolo Rivera Mr. Kurt Gerard See Ms. Denise Jannah Serrano Mr. Miguel Borromeo Mr. Jesus Carlos Exequiel Castillo Mr. Christopher James Cabuay	Effective Labor Market Signaling: A Strategy for Solving the Problem of Unemployment and Talent Mismatch	Asia-Pacific Economic Cooperation (APEC)
Mr. Marvin Raymond Castell Dr. Tereso S. Tullao, Jr. Mr. Marvin Raymond Castell Dr. Lawrence B. Dacuycuy Mr. Angelo B. Taningco	Research study on The Roles and Functions of the Banking Sector in the Financial System of the ASEAN+3 Region	ASEAN Secretariat under the ASEAN+3 Research Group
Dr. Tereso Tullao, Jr. Ms. Ma. Concepcion Latoja Mr. Dickson Lim Ms. Paulynne Castillo Ms. Madeleine Balane Ms. Rhory Fernandez Ms. Gina Ledda Mr. Roberto Raymundo Mr. Roderick Bugador Mr. Christopher James Cabuay Ms. Denise Serrano	Development of Industry Career Guides	Department of Labor and Employment
Dr. Ponciano Intal, Jr. Dr. Winfred Villamil Mr. Miguel Borromeo	Towards Innovative, Liveable and Prosperous Asian Megacities	International Development Research Centre (IDRC)
Dr. Celia M. Reyes	CBMS-OPHI Project	Australian Agency for International Development (AusAID) through Oxford University, UK

PROJECT DIRECTOR/ASSOCIATES	PROJECT TITLE	FUNDING AGENCY
Dr. Celia Reyes Ms. Anne Bernadette Mandap Ms. Jasminda P. Asiro Mr. Joel Bancolita Mr. Marsmath Bans, Jr. Mr. Juan Paulo Fajardo Ms. Alellie Sobneviñas Ms. Erica Paula Sioson Ms. Julie Ann Nadela Ms. Cecilia Ozamiz	CBMS-UNDP Development Grant Program 2007	United Nations Development Programme (UNDP)-Manila
Dr. Celia Reyes Ms. Anne Bernadette Mandap Ms. Jasminda P. Asinot Mr. Joel Bancolita Mr. Marsmath Bans, Jr. Mr. Juan Paulo Fajardo Ms. Alellie Sobreviñas Ms. Erica Paula Sioson Ms. Julie Ann Nadela Ms. Cecilia Ozamiz	CBMS-Development Grant Program 2005-2006	United Nations Development Programme (UNDP)-Manila
Dr. Celia Reyes Ms. Anne Bernadette Mandap Ms. Jasminda P. Asiro Mr. Joel Bancolita Mr. Marsmath Banis, Jr. Mr. Juan Paulo Fajardo Ms. Alellie Sobreviñas Ms. Erica Paula Sioson Ms. Julie Ann Nadela Ms. Cecilia Ozamiz	Sustained Capacity Building fan NAPC CBMS Core Trainers	Funding Agency: United Nations Development Programme (UNDP)-Manila
Dr. Celia Reyes Ms. Anne Bernadette Mandap Ms. Jasminda P. Asinot Mr. Joel Boncolita Mr. Mansmath Banis, Jr	Poverty and Economic Policy (PEP) Network Project Phase III	International Development Research Centre (IDRC)-Canada and the Canadian Agency for International Development (CIDA)
Dr. Celia Reyes Ms. Anne Bernadette Mandap Ms. Jasminda A. Quilitis Mr. Joel Boncolita Mr. Marsmath Bans, Jr. Mr. Juan Paulo Fajardo Ms. Alellie Sobreviñas Ms. Erica Paula Sioson Ms. Julie Ann Nadela Ms. Cecilia Ozamiz	Poverty and Economic Policy (PEP) Network Project Phase II	International Development Research Centre (IDRC)-Canada
Dr. Celia Reyes Ms. Anne Bernadette Mandap Ms. Jasminda A. Quilitis Mr. Joel Boncolita Mr. Marsmath Bans, Jr. Mr. Juan Paulo Fajardo Ms. Alellie Sobreviñas Ms. Erica Paula Sioson Ms. Julie Ann Nadela Ms. Cecilia Ozamiz	Capacity Building of NAPC and Local Governments in Poverty Diagnosis, Planning and Monitoring through the CBMS	United Nations Development Programme (UNDP)-Manila
Dr. Celia Reyes	CBMS NAPC Collaboration(500-078)	PEP-CBMS Network Team

PROJECT DIRECTOR/ASSOCIATES	PROJECT TITLE	FUNDING AGENCY
ADVANCED RESEARCH INSTITUTE FOR INFORMATICS, COMPUTING AND NETWORKING (ADRIC)		
Dr. Rachel Edita Roxas	Automatic Detection of Code-Switching from English-Filipino	DOST-PCIERD
Dr. Rachel Edita Roxas	PANeGOV: Understanding Democratic eGovernance in Asia	IDRC
Ms. Ethel Ong	Inferencing Over Common-Sense Knowledge for Story Generation	ERDT
Ms. Ethel Ong	Enhancing Event-Based Semantics in the Ontology of Picture Book 2	ERDT
LASALLIAN INSTITUTE FOR DEVELOPMENT AND EDUCATIONAL RESEARCH (LIDER)		
Dr. Shirley Dita	Ibanag Orthography CED LIDER 07 L 1TA12-3TA12	ERDT
CENTER FOR ENGINEERING AND SUSTAINABLE DEVELOPMENT RESEARCH (CESDR)		
Mr. Bryan Gobaco	A Product Line Design and Strategy Model for Manufacturing and Marketing Tradeoffs GCOE CESDR 53 L 3TAY11-3TAY12	ERDT
Dr. Joseph Auresenia	Microwave Chemical Vapor Deposition Synthesis of Carbon Nanotubes from CO ₂ and C ₂ H ₂ using nickel, cobalt and molybdenum catalysts GCOE CESDR 33 L 2TAY09-1TAY12	ERDT
Dr. Elmer Dadios	Design and Development of a Wireless Communication Link for Underwater Robot System GCOE CESDR 16 L 1TAY11-3TAY12	ERDT
Dr. Elmer Dadios	Design and Development of an Autonomous Underwater Vehicle (AUV) with Fuzzy Logic-based Controller GCOE CESDR 17 L 1TAY12-3TAY12	ERDT
Dr. Edwin Calilung	Detection of floating impurities in filled Beverage Bottles using Digital Image Processing Techniques	ERDT
Dr. Lessandro Garciano Dr. Renan Ma. Tanhueco Mr. Alden Paul Balili Mr. Lewdan Ferrer (Graduate Student) Co-Investigator: Prof. Koike Takeshi, Kyoto University	Flood Hazard Assessment & Disaster Prevention Planning of Electric Power Systems in Metro Manila and other Interdependent Lifelines	AUN/SEED-NET JICA

PROJECT DIRECTOR/ASSOCIATES	PROJECT TITLE	FUNDING AGENCY
Dr. Luis F. Razon Dr. Raymond Girard Tan Ms. Cynthia Fabian Japanese Co-investigator: Prof. SAKA Shiro, Kyoto University Co-investigator from other Member Institution: Dr. Suryo Purwono, Gadjah Mada University	In-situ Transesterification of Coconut Oil	AUN/SEED-NET JICA
Dr. Nathaniel Dugos Dr. Susan Roces Japanese Co-investigator: Prof. Dr. SUZUKI Masaki, Tokyo Institute of Technology Co-investigator from other Member Institution: Dr. Ing. Kusnanto, Gadjah Mada University	Coconut Oil Biodiesel as an Emulsifier in Diesel-Ethanol Blends for Diesel Engines	AUN/SEED-NET JICA
Dr. Nathaniel Dugos Dr. Susan Roces Japanese Co-investigator: Prof. Dr. SUZUKI Masaki, Tokyo Institute of Technology Co-investigator from other Member Institution: Dr. Ing. Kusnanto, Gadjah Mada University	Coconut Oil Biodiesel as an Emulsifier in Diesel-Ethanol Blends for Diesel Engines	AUN/SEED-NET JICA
Dr. Josephine Borja Dr. Joseph Auresenia Japanese Co-investigator: Prof. Dr. NAKASAKI Kiyohiko, Tokyo Institute of Technology Co-investigator from other Member Institution: Dr. NGO Manh Thang, Ho Chi Minh University of Technology	Degradation of DDT by Combined Zero Valent Iron and Biological Process	AUN/SEED-NET JICA
Ms. Wilheliza A. Baraoidan Dr. Joseph Auresenia	Biodegradation of 17-a-Ethynylestradiol (EE2) from Contraceptive Pills	AUN/SEED-NET JICA
Dr. Leonila Abella	The Effect of Ni:Cu Ratio on the Catalytic Activity of Ni-Cu/AC Catalysts for the Thermocatalytic Decomposition of Methane	ERDT
Dr. Leonila Abella	CNT Production through the Thermal Catalytic Decomposition of Methane over Ni-Cu/Al ₂ O ₃	ERDT
Dr. Susan Roces	Continuous Transesterification of Jatropha Oil Via Microwave Irradiation	ERDT
Dr. Susan Roces	Optimization of Coco-Biodiesel Production Through Conventional and Microwave Heating and Phase Equilibria Analysis of the Transesterified Coconut Oil Using UNIFAC-LLE Model	ERDT

PROJECT DIRECTOR/ASSOCIATES	PROJECT TITLE	FUNDING AGENCY
Dr. Josephine Borja	Production of Bioethanol Through Cofermentation of Rice Straw Hydrolysates by <i>Saccharomyces Cerevisiae</i> and <i>Pachysolen Tannophilus</i>	ERDT
Dr. Jonathan Dungca	Strength and Permeability Characteristic of Road Base Materials Blended with Fly Ash and Bottom Ash	ERDT
Dr. Jonathan Dungca	Blending of Processed Lime Materials for Use in Sub-grade, Sub-base and Base Construction	ERDT
Mr. Ronaldo Gallardo	Influence of Seawater Mixing on Reinforced Mortars with the Comparison of Varying Fly Ash, Replacement Ratio, Water Binders Ratio, Curing Conditions and Type of Steel Bars	ERDT
Dr. Alvin Chua	Automated Bulk Cartoning of Folded Sachet Linked Strips Using Constrained Gravity Stacking	ERDT
Dr. Nilo Bugtai	Rapid Prototyping Methodology of a Non-Assembly Robotic Structure with a Shape Memory Alloy (SMA) Actuator	ERDT
Dr. Nilo Bugtai	Comprehensive Gait Data Acquisition System	ERDT
Dr. Felicito Caluyo	Heuristic Approach in Modeling Radio Path Loss Inside Residences for Fixed & Portable Digital Terrestrial Television at 677 MHz	ERDT
Mr. Roderick Yap Mr. Edwin Sybingco	Noise Robust Automatic Speech Recognition System Through Spectral Subtraction Implemented on FPGA	ERDT
Ms. Antonette Roque	Geographic Routing for VANET in Real Highway and City Scenarios	ERDT
Mr. Cesar Llorente	Artificial Neural Network Implementation of MMDA's Vehicle Tagging Scheme to Public Utility Buses in the City in Improving Violations Apprehension Rate	ERDT
Mr. Edwin Sybingco	Image Fusion of Multidirectional Wavelet Transform for Image Denoising	ERDT
Dr. Rosemary Seva	The Measurement of the Cognitive Work Ability of Nurses	ERDT
Mr. Bryan Gobaco	Tactical Risk Mitigation Strategies in a Global Supply Chain with Continuous Risk	ERDT
Dr. Alvin Chua	Vision Based Pedestrian Detection Using Motion and Boosted Histogram of Oriented Gradients	ERDT

PROJECT DIRECTOR/ASSOCIATES	PROJECT TITLE	FUNDING AGENCY
Dr. Pag-asa Gaspillo Dr. Aileen Huelgas Japanese Co-investigator: Prof. Dr. HINODE Hirofumi, Tokyo Institute of Technology Prof. FUNAMIZU Naoyuki, Hokkaido University Co-investigator from other Member Institution: Dr. Nguyen Ky Phoung Ha, Ho Chi Minh City University of Technology	Wastewater Treatment using Electrocoagulation Method	AUN/SEED-NET JICA
SOCIAL DEVELOPMENT RESEARCH CENTER (SDRC)		
Dr. Jesusa Marco Ms. Ysadora Mendoza	Ecological, Biological and Social Factors of Vector Density – Developing an Effective Approach to Dengue Control in the Philippines Phase II	World Health Organization /TDR
CENTER FOR NATURAL SCIENCES AND ENVIRONMENTAL RESEARCH (CENSER)		
Dr. Wilfredo Licuanan Dr. Antonio P. Contreras Dr. Roberto Javier Jr. Dr. Teresa De Guzman Dr. Dennis Erasga Prof. Marlon Era Mr. Melvin Jabar	Political Economy of the Use of knowledge and research evidence in Urban Resilience Interventions in the Philippines	Overseas Development Institute (ODI)
Dr. Roberto E. Javier Jr. Prof. Graeme Ferdinand Armecin Prof. Dindo Café Dr. Mitzie Conchada Dr. Dennis Erasga Dr. Ma. Teresa de Guzman Prof. Oliver Malabanan Dr. Maria Guadalupe Salanga Dr. Dennis Trinidad Dr. Homer Yabut	Comprehensive Study on Scholarship and Financial Assistance Programs in the Philippines	Australian Agency for International Development (AusAid)
Dr. Ferdinand Dagmang	Evaluation of the Basic Ecclesial Community of PCP II	Missio Munich

DE LA SALLE UNIVERSITY PUBLISHING HOUSE (DLSUPH)

Introduction

The newly-established publishing house endeavors to enhance the educational mission of De La Salle University by publishing 1) works by both established and new scholars in the field of Philippine studies in a variety of genres; 2) specialized and peer-reviewed research that is generally not accommodated for publication due to its circumscribed readership; and 3) journals in a wide range of academic disciplines including education, business and economics, the social sciences, and the physical sciences.

These publications are undertaken in the spirit of 1) enhancing further scholarship; 2) fostering discussions on the level of ideas; and 3) encouraging participation in public debates – with the end goal of sustaining and extending the momentum for positive change in human society.

Its Publication, Board meets once a term with the main function of reviewing the manuscripts to be published after they have gone through the standard procedures of evaluation and review.

The Growth and Excitement

Academic Year 2012-2013 saw the beginning of the DLSUPH. Dr. David Jonathan Y. Bayot, “David” to colleagues and friends, came in as Executive Publisher of the newly-



The **DLSU Publishing House (DLSUPH)** is the publishing center of the University. It is a unit under the Office of the Vice Chancellor for Research and Innovation “mandated to enhance the image of DLSU as an intellectual leader in terms of research and knowledge dissemination.” It foregrounds the University’s mission of excellence in research and education by publishing academic and trade books, as well as scholarly journals – in both print and electronic editions.

Since it transitioned on May 16, 2012 from the former Academic Publications Office (APO), the DLSUPH has envisioned itself as a notable center of knowledge production and dissemination – through book and journal publication – in both the national and the international milieu. DLSUPH assumes the task of being a key conduit of ideas reaching out to readers worldwide – in the hope that readers will process, transform, and eventually, mobilize these ideas for a better society in general and Philippine communities in particular.

established publishing house at the time when Brother Ricardo P. Laguda FSC was also coming in as the President and Chancellor of DLSU.

From an Idea to a Vision. It was Brother Ricky who raised the idea of a university press tasked to do exemplary publishing work that would be recognized by the international academic community. He cited the University of Chicago Press as an example. Almost instantaneously, the image of the University of Chicago Press – the largest university press in the United States with a staff size of 300 – impressed upon David who was about to lead his team of three. But he was not likely to easily shun from the challenge posed by Br. Ricky without giving it a try. David, thus, steered the publishing house guided by this vision.

At the onset, David took over DLSUPH and has since managed it as a new office. It no longer had to undertake publications that would cater to the demands of former APO commercial publisher partners.

Sustainability. As regards the major challenges that he experienced during the academic year, he candidly referred to them as “the sources of excitement” in managing the daily operations of his office. Being a businessman for the most part of his life, David explained that while it was made clear to him at the start that the publishing house was not expected to generate income, his team, however, wanted to look at DLSUPH as a business unit in the sense that it should practically be self-sustaining.

To fulfill La Salle's educational mission, a significant portion of DLSUPH's income is donated to various libraries in the country. Motivated by a desire to attain a break-even income level, David thought of establishing partnerships and collaborations with local and international foundations for the publication of scholarly works. Thus, for AY 2012-2013,

DLSUPH partnered with the Asia-Europe Foundation (ASEF) in producing *The Health Dimension of Asian Migration to Europe* authored by Drs. Trinidad S. Osteria, Daniela Carrillo, and Anna Vittoria Sarli. ASEF is the only permanently established institution of the Asia-Europe Meeting (ASEM) which consists of the leaders of 25 European and Asian countries, together with the European Commission. It is funded by voluntary contributions from its member governments and shares the financing of its project with civil society partners across Asia and Europe.

Print on Demand. David revealed that his first move was to make everything done via “print on demand,” such that if he printed 100 copies and not all the copies get sold, he would not incur as much losses as did the former DLSU Press Inc. because of the latter's machines, overhead, and personnel expenses. He was clearly aware that this first measure would address several other problems earlier experienced by DLSUPH's forerunners, such as storage requirement and overstocking that meant loss of liquidity.

Given DLSUPH's emphasis to produce good and fine-looking books in terms of both content and physical appearance, David has paid close attention to the quality of the printed output. He would carefully specify the font size, the leading and spacing between characters, the quality of paper or stock, and the overall layout to achieve a healthy balance of print and white spaces, among other things, that would render the book more reader-friendly. To address all these concerns, David partnered with no less than Books on Demand, the official printer of Asian Development Bank. Books on Demand is able to meet the requirements of the DLSUPH because it operates the only Espresso Book Machine in South East Asia, a machine capable of printing, binding, and cutting a book in ten minutes or less – thus, an entire printing press in one compact package.

Subcontracting Tasks. Except for a junior house-editor for the humanities and the two original APO staff, David did not hire any additional permanent personnel. All the other jobs i.e., editing (for Filipino and the social sciences), translation, cover design, printing, and so on are subcontracted or outsourced.

David's resourcefulness can be gleaned from the fine and elegant covers of DLSUPH printed books. He rummaged through the Doreen and Wili Fernandez collection at The Museum at DLSU and meticulously selected those that can be used as DLSUPH book cover designs. Thereafter, he contacted the now late Ms. Della F. Besa, sister of the late Doreen Fernandez, to obtain permission to use certain artworks in the Fernandez collection for the DLSUPH book covers. He makes sure that the artworks used are properly and appropriately acknowledged in the printed books. To easily identify books in a series, he uses the same artwork but slightly modifies the color tone to make each volume distinct.

David considers himself very fortunate in terms of being accorded confidence by the University Publications Board which, during its first year, was headed by the President and Chancellor himself. This confidence, according to David, provides him the necessary space to envision for the press and to get the vision off the ground. He is able to make quick and sound decisions, eliminating consultations and debates, which could eat up substantial amount of time that can translate into loss of good opportunities. Thus far, David has been an effective manager, equipped with the following skills and talents necessary to run a publishing house: good leadership, sound management style, excellent writing and editing skills, marketing and public relations expertise, a critical mind, and a good aesthetic sense.

He, however, admits that there is also a downside to this organizational set up where he simultaneously handles the job of an acquisitions editor, editorial director, and rights

editor, on top of his other responsibilities as executive publisher of DLSUPH because it gets to a point when he would feel he can only do so much. Therefore, he has tried to get competent professionals to work as his co-interviewers for the "critic in conversation" series, for example. Many of those he approached declined the invitation, perhaps after realizing how tough the job will be, which would require an adjustment of their own schedule to that of the author they will be interviewing who is a with prominent person and an icon in his/her field.

Apart from taking care of the authors, David makes sure that those who work with the DLSUPH for subcontracted tasks are paid reasonable rates and on time.

Marketing. DLSUPH marketing is currently being done, albeit crudely, through Solidaridad Bookshop, Rarebook Enterprises, and Booktrends, Inc. When asked why DLSUPH has not explored the online system for ordering books, David explained that it would be premature to start talk on an online system for the marketing of DLSUPH books as there are a few critical issues concerning modes of payment that have yet to be sorted out with the University Accounting Office.

DLSUPH Welcomes Aboard Prominent Foreign Authors. In AY 2012-2013 DLSUPH was able to publish big names in the academic circles. They include Marjorie Perloff, Christopher Norris, and Catherine Belsey.

The Philippine edition of Perloff's *Poetics in a New Key* significantly came out at the time DLSUPH turned one year in 2013. Not long after its release, DLSUPH received a request from the University of Chicago Press for a license to publish the book, a gesture which would make *Poetics in a New Key* the first Philippine-published book in history to be licensed to a major university press for international circulation.

Why Foreign Authors?

David had often been asked, why DLSUPH, a Philippine press, is publishing foreign authors. He asserted that he has always considered DLSUPH as the University's other "window to the world." Through the publication of books authored by prominent foreign scholars, it helps broaden perspectives, achieves a better understanding of socio-cultural differences and realities, and enriches the readers' learning experience, among others. However, to address the question, he elaborated on the following three major reasons for publishing foreign authors:

Strategic Reason. David points out that it seems rather unfair to conclude that DLSUPH publishes only or mostly foreign authors because it also publishes a significant number of Filipino scholars. In as much as David is convinced of the importance of the presence of Philippine authors in DLSUPH and its vision-mission, he reiterated the significance of the canonical presence of foreign authors in terms of their contribution to the image of DLSU in the international academic community. In David's view, these "authoritative" presences – much that the term sounds incorrect in this era where people tend to talk about political correctness as if it were an organic entity of inviolable dogma – would make a world of positive difference to DLSU in terms of the perception the university will gain from the international academia.

Canonical Names. In support of the university's direction toward internationalization, DLSUPH can serve as a "window to the world," and this can be realized by bringing on board foreign authors. David emphasized that with reference to foreign authors, he is not pertaining to the skin color of the author, or their nationality as "foreign" author. Rather, he is chiefly interested in

foreign authors who have gained prominence in their respective fields and are internationally acknowledged as major players in their respective disciplinary leagues, and who can contribute to the scholarly pursuit and enrich the Filipino mind, broaden his perspective, and bring honor to and accord prestige to the University.

Revisioning the Idea of Philippine Studies.

Regarding the popular view that Philippine press should publish something that will further the cause of Philippine Studies, and which excludes publishing foreign authors, David mentioned that there are two perspectives for looking at Philippine Studies: the traditional view or the more commonsensical view, which is publishing a Filipino author writing on a Philippine topic; and the revisionist view, which looks at Philippine Studies as a field of inquiry that is enriched not only by in-breeding, but also by welcoming and appropriating new ideas from foreign authors. He cited a fact that if one looks at books authored by major Philippine critics, their bibliography pages would reveal a generous list of authors from the Western academic circles. David further reasoned that the foreign authors published by DLSUPH serve to enrich the learning experience of Filipino readers and writers, in particular. Therefore, DLSUPH would be doing a disservice to Philippine Studies if it excludes the foreign authors' ideas on grounds of naïve, "empiricistic" sense of nationalism.

Journals Published

Several scholarly journals that served as fertile venues for discussing contemporary issues affecting the various sectors of society, and the region and surfacing new ideas and topics for research were also published within the academic year.



The Asia-Pacific Education Researcher (TAPER) is an international refereed journal of original research in education, published biannually by the Academic Publications Office, De La Salle University,

Manila, Philippines. It aims principally to provide a venue for the publication of empirical and theoretical studies in education, with emphasis on the experiences of successful educational systems in the Asia-Pacific Region and of the national educational systems therein that are presently underrepresented in the research literature.

The journal seeks to publish two types of articles:

- *Research Articles* that report original research work that leads to the understanding and/or improvement of educational processes and outcomes using research methods and analytic frameworks of the varied academic disciplines (anthropology, applied linguistics, cognitive science, economics, history, philosophy, political science, psychology, sociology, among others) and also using multidisciplinary and interdisciplinary approaches;
- *Short Research Reports* that describe and analyze results of small-scale research such as:
 - preliminary investigations on particular educational experiences, outcomes, and processes in a specific country or region of a country that are of broad interest to educational scholars in the rest of the Asia-Pacific region,
 - integrative and critical reviews of research on a specific educational topic conducted in a specific country in the Asia-Pacific region,
 - studies that seek to validate educational theories, principles, constructs, and research instruments originally developed in western countries in the

context of specific Asian countries or educational communities,

- studies that seek to replicate educational studies that were originally done in western countries in the context of specific Asian countries or educational communities,
- participatory action research on educational problems and experiences of specific educational programs of any country in Asia, and
- cross-national studies that seek to compare and contrast specific educational experiences and process in at least two countries in Asia.

The Asia-Pacific Education Researcher

is listed in Thomson Reuters ISI Scientific Database, SciVerse Scopus, indexed and abstracted in the Social Sciences Citation Index, Social Scisearch, and Journal Citation Reports/ Social Sciences Edition, and EBSCO.

The Asia-Pacific Education Researcher is accredited by the Philippines' Commission on Higher Education as one of the most distinguished Philippine journals, and is classified in Category A of scholarly journals in the Philippines.

Editor: Dr. Allan B.I. Bernardo

Issues: Volume 21 Number 1, March 2012;
Volume 21 Number 2, July 2012;
Volume 21 Number 3, November 2012



The Asia-Pacific Social Science Review (APSSR) is an internationally refereed journal published biannually by the De La Salle University, Manila, Philippines and is abstracted by Scopus. It aims to introduce a

venue for the discussion of contemporary issues related to economics, politics, development, society, and international relations. Subject matter should be on topics

that concern the Asia-Pacific region, or that which provides a perspective from within the region. The APSSR encourages theoretical and methodological papers with an emphasis on comparative study and empirical research addressing development problems in Asia and Pacific contexts. It seeks to publish research arising from a broad variety of methodological traditions and those with multi- and inter-disciplinary focus.

Editor: Dr. Julio C. Teehankee, *De La Salle University*

Managing Editor: Mr. Al James C. Untalan, *De La Salle University*

Issues: Volume 12 Number 1, June 2012;
Volume 12 Number 2, December 2012;
Volume 13 Number 1, June 2013



The *DLSU Business & Economics Review (DLSU B&E Review)* publishes high quality theoretical, empirical, and methodological research in the fields of accounting, business management, commercial law, economics, finance, and marketing. The DLSU Business & Economics Review aims to reach an audience in these six fields and is published twice a year. It is listed in SciVerse Scopus since 2011 and abstracted and indexed in EBSCO since 2009. It is also accredited by the Commission on Higher Education as one of the most distinguished Philippine journals classified in Category A level since 2009.

Editor: Dr. Tereso S. Tullao, Jr.

Managing Editor: Dr. John Paolo R. Rivera

Issues: Volume 22 Number 1, July 2012;
Volume 22 Number 2, January 2013;
Volume 23 Number 1, July 2013



Ang *Malay*, isang international refereed at abstracted journal na multi-disiplinari sa Filipino, ay inililimbag makalawa isang taon sa ilalim ng pamamahala ng De La Salle University Publishing House para sa Pamantasang De La Salle. Bilang journal na multi-disiplinari, nagtatampok ang *Malay* ng mga papel, pananaliksik, at artikulong naglalahad ng mga kaisipan at kaalaman mula sa iba't ibang disiplina sa larangan ng Araling Filipino. Ang mga ideya, pagkukuro, at paninindigan ng mga may-akda ay pananagutan nila at hindi repleksyon ng mga paghahaka at patakaran ng Mga Patnugot, ng Kaguruan, o ng Pangasiwaan ng Pamantasang ito.

Editor: Dr. Florentino T. Timbreza

Managing Editor: Dr. Rowell D. Madula

Issues: Volume 25 Number 1, September 2012; Volume 25 Number 2, April 2013



The *Manila Journal of Science (MJS)* is a refereed and indexed* online publication of De La Salle University. MJS accepts manuscripts from all areas of biology, chemistry, physics, engineering, computing, mathematics, environmental science and other subjects that might be of interest to the science community.

Editor: Dr. Eric Camilo R. Punzalan

Managing Editor: Ms. Prane Mariel B. Ong

Issues: Volume 8 Number 1, September 2012;
Volume 8 Number 2, March 2013

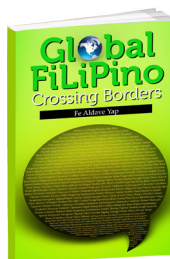
LIST OF BOOKS PUBLISHED IN AY 2012-2013

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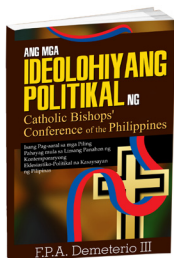
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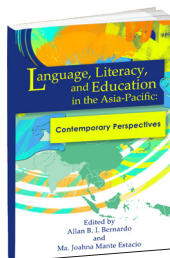
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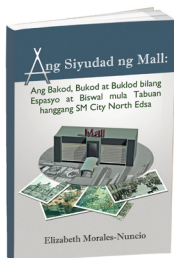
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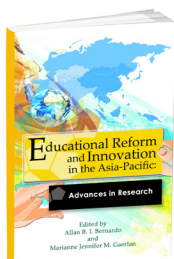
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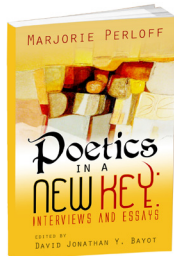
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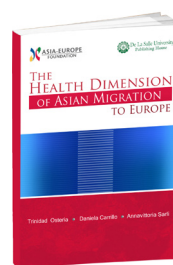
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Poetics in A New Key: Interviews and Essays (Philippine Edition)



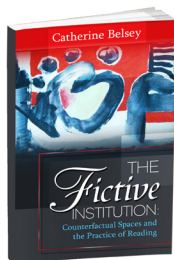
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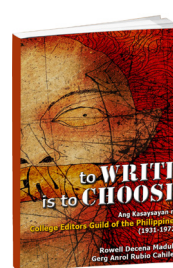
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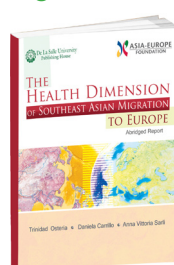
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The Health Dimension of Southeast Asian Migration to Europe: Abridged Report



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DLSU INTELLECTUAL PROPERTY OFFICE (DIPO/DITO)

In 2008, DLSU was among the first private universities in the Philippines to establish an Intellectual Property (IP) Office, and to draft and implement a set of comprehensive policies on Intellectual Property (IP). DLSU has also set the record for being the first university to set up the Intellectual Property Advocates (IPA), a student organization that promotes within its ranks greater awareness of and respect for IP. The IPO Philippines Director General Ricardo R. Blancaflor complimented DLSU on these achievements and expressed hope that other schools, colleges, and universities would replicate DLSU's IP initiatives.

The need to formalize DLSU's IP practices in a document was deemed important in 2004 when the first IP Policy for DLSU came into being. In 2006, the Office of the Associate Director for Intellectual Property (AIPO) was established with the mandate to "develop an intellectual property strategy for La Salle", and "assist faculty and students in filing for protection of intellectual property". The AIPO was envisioned, among others, "to educate the academic community on the important role of IP protection in securing inventions, facilitating technology transfer, and encouraging inventors to disclose their work". The AIPO was under the Office of the Vice-Chancellor for Research (VCR).

In 2008, the AIPO was reorganized into the DLSU Intellectual Property Office (DIPO) still under the Office of the VCR. then, in AY 2011-2012, the DIPO was placed under the Office of the Associate Vice Chancellor for Research and Learning. The move further strengthened its capability to fulfill its mandate. It was tasked to review and refine the initial set of policies to make it more comprehensive and enable the university to better promote and encourage creativity, excellence, and innovation in research and other scholarly endeavors. To better reflect the interests of the members of the academic community, especially among the faculty and students, the policies underwent another round of revisions in 2009. In 2010, the DIPO also formulated the corresponding set of implementing rules and regulations (IRR) on IP and thus made a new round of revisions on the previous IP policies. Both the revised set of policies and the IRR were approved by the Vice Chancellor for Academics and Research (VCAR) Council in the same year. The policies include a definition of key IP terms, coverage and ownership of IP, and functions of the DIPO and IP offenses.

DLSU's IP Policies cover the two basic categories of IP: industrial property (i.e. patents for invention, utility models, industrial designs, and trademarks) and copyright and related rights. These are interpreted in terms

of two major concerns of the University: first, that as a resource of Church and State, DLSU is committed to the use of invention and intellectual creation for the common good, and second, that DLSU is committed to scholarship and to the academic freedom of its faculty to write and publish. It is noteworthy that the primary consideration in the protection and commercialization of the university's intellectual property is not the chance to make profits but the chance to benefit society as a whole.

In 2010, DLSU achieved another milestone in its IP history with the inclusion of IP policies in the Student Handbook 2009-2012. These policies continue to be part of the 2012-2015 Student Handbook. Moreover, as the DIPO has stressed, teachers now have an opportunity to publish for purposes of career advancement. They can now file for a patent on their inventions and earn promotion once the patent is granted. While it is true that the grant of a patent takes around five to seven years from the date of application, the DITO emphasizes that planting the "IP seeds" today will enable the researcher/inventor to reap the "patent fruits" in the future.

In 2011, the IPO Philippines organized the Innovation and Technology Support Office (ITSO) network, of which DLSU is a founding member. The ITSO network, composed of over 50 universities and colleges throughout the country, aims to strengthen local and institutional capacity to access patent information and use the patent system. It seeks to fulfill the mandate of IPO Philippines relative to its 3D IP 2020 Vision, which is "to demystify and democratize the patent system and use it as a tool for national development".

As part of the ITSO network, the DLSU Innovation and Technology Office (DITO) was established to be a patent library that would serve the intellectual property and commercialization needs of the university. DIPO Director Christopher E. Cruz became the

manager of the DITO, also a unit under the Office of the VCR. The DITO serves as a "one-stop shop" for inventors, scientists, artists, academics, and entrepreneurs who may want to turn their innovative ideas into products and services for IP protection, incubation, and eventual commercialization. The office is ready to help link DLSU's research and development activities to industry by assisting start-up companies whose success in the future will redound to the economic development of the country.

In November 2012, the DITO held the first DLSU Innovation and Technology Fair at the Henry Sy Sr. Hall. The DITO was the first and only ITSO member at that time to organize such a fair. The event showcased the different projects and inventions across the colleges to create greater awareness of the importance of IP protection and innovation. The resource speakers at the fair shared their experiences in the intellectual property and innovation ecosystem. Another key activity was the business plan pitch competition, which underscored the need to highlight the market and financial viability of ideas to create sustainable ventures and to deliver compelling messages that would attract potential funders and partners. The fair culminated in a panel discussion on the Philippine-California Advanced Research Institute (PCARI), a project of the Commission on Higher Education (CHED). The CHED planned to promote research collaboration among Philippine Higher Educational Institutions and the University of California in the areas of IT and health, with a view to eventually commercializing research output for global deployment.

The DITO team is composed of representatives from the College of Science, College of Engineering, College of Computer Studies, and Ramon V. Del Rosario College of Business. These representatives regularly attend IP training sessions and seminars sponsored by the IPO Philippines under the

ITSO program and the World Intellectual Property Organization (WIPO). The IPO Philippines cooperates with IP-related initiatives of the Association of South East Asian Nations (ASEAN), Intellectual Property Alumni Association, Japan Patent Office, European Patent Office, United States Patent and Trademark Office, and Licensing Executives Society, among others. This cooperation equips its members with the necessary tools, expose them to relevant experiences in handling IP applications and advocacies, and update them on IP developments.

As a member of the ASEAN University Network Intellectual Property (AUN-IP), DLSU acknowledges and supports the undertakings of the ASEAN Project on the Protection of Intellectual Property Rights (ECAP III). ECAP III aims to create an effective national and regional university IP network that will support IP education as well as policy research and formulation in the region. DLSU has pledged to implement IP concepts and practices, share experiences in its implementation of its IP policy so that the AUN-IP members can formulate a common IP policy before embarking on educational cooperation activities and collect international best practices concerning IP management. Also part of the ECAP III project are courses on IP education offered to students towards the development of an “ASEAN IP brand.” DLSU offers the following courses:

- Intellectual Property Law – a 3-unit course that introduces undergraduate students to the concept of IP; terms such as copyright, trademark, trade name, patent and invention; and the benefits of registration in and protection under IP;
- Legal Aspects of Advertising and Promotions – a 3-unit course that includes discussions on various kinds of IPs, particularly on trademarks and designs, and the legal rights and protection given to their owners.

The DLSU College of Law also offers both basic and advanced IP courses.

The need to increase awareness of IP rights and their effects on society and business remains the toughest challenge to the DIPO/DITO, given that IP awareness is relatively low both in the University and in the country as a whole. The DIPO/DITO hopes to achieve such awareness through its regular trainings, workshops, and interactions with all the stakeholders in the university and encourages the faculty to “Patent, Publish, and Profit.” Director Cruz underscores the fact that when one makes his work public before registering with the IPO Philippines, his idea can easily be picked by someone else who can beat him in its IP registration.

The process of actively promoting IP awareness and encouraging the faculty and students to exercise their rights to apply for exclusivity over their creations is definitely long and tedious. This may be partly due to lack of information and the habit of “copying” that appears to be deeply entrenched in Filipino culture. Recognizing these blocks, the DIPO/DITO has devised mechanisms and designed forms to spare property owners from going through tedious procedures. They simply need to provide the DIPO/DITO with a duly accomplished Disclosure Form, which can be downloaded from the DIPO website. Upon receipt of the required information, the DIPO/DITO evaluates it and translates the form into a Patent Application. The DIPO then notifies the owner of every step in the patent process up to the grant of the patent.

Regarding theses or dissertations, the question of who will own the IP should be addressed before the students start work on their properties. At present, the mentor determines if there is a potential patentable creation that can come from a student’s work. If there is, he reports it to the IP Auditor in his college.

In AY 2012-2013, there were pending applications for patent with the IPO for the following inventions:

- Automated hospital bed;
- Design and fabrication of polymer-based photovoltaic cells/storage devices;
- A biodegradable filter using coconut derived activated carbon and citricidal; and
- Gas Phase Tin-Oxide Nanoparticle Synthesis.

The lack of IP awareness and appreciation among the faculty, students, and staff, the difficulty in encouraging disclosure of inventions and creative works, the lack of a mechanism for IP audit and IP valuation, and the challenges in networking for commercialization are major concerns of the DIPO/DITO, but it is confident that DLSU, along with the stakeholders, will be able to hurdle these.

FINANCIAL REPORT

DE LA SALLE UNIVERSITY Research Expenditure Analysis AY2012-2013

	JUNE 01, 2012 TO MAY 31, 2013	
	BUDGET	EXPENSE
INTERNALLY FUNDED RESEARCH		
<u>DLSU-MANILA</u>		
<i>Sourced from DLSU Budget:</i>		
Research Centers and Offices	45,815,991	37,555,889
Research Deloading	15,001,002	15,001,002
Research Honorarium	714,558	714,558
Sabbatical	10,623,755	10,623,755
Research Incentive I (Longevity)	32,545,654	32,545,654
Research Incentive II	21,960,748	21,960,748
Sub-total	126,661,707	118,401,604
<i>Sourced from Depository Funds:</i>		
College Research Funds	1,058,692	623,742
Research Fellows Fund	945,220	0.00
New PhDs Research Fund	700,856	412,486
Research Faculty Grants	143,714	0
Other Internally Funded Research	1,028,084	227,611
Sub-total	3,876,566	1,263,839
<u>SCIENCE FOUNDATION</u>		
Scientific Research & Development Grant		
Grants for professorial chair	2,630,000	1,881,149
Publication Incentive Grants	14,000,000	2,175,340
Faculty Travel Grants	1,400,000	7,642,414
Other Grants	800,000	675,214
Conference Fees		
Other Grants- Angelo King, Sikat 2, CCS-NCCA	1,400,000	1,382,760
Sub total	3,000,000	2,729,974
	23,230,000	15,670,329
<i>Research Overhead Costs:</i>		
Office Space, Electricity and Water	59,485,182	59,485,182
Total Internally Funded Research (IFR)	213,253,454	194,820,954

	JUNE 01, 2012 TO MAY 31, 2013	
	BUDGET	EXPENSE
EXTERNALLY FUNDED RESEARCH		
<i>Research Centers / Units</i>		
AKIEBS	44,402,271	24,479,610
LIDER	2,837,802	2,499,469
SDRC	11,054,661	1,168,018
AdRIC	12,894,049	8,325,254
CESDR	1,071,389	111,717
ARRPET	638,476	271,479
AUN SEED/net	7,646,111	2,934,912
CENSER	14,727,268	4,194,557
LSIG	8,704,342	9,269,977
Other Externally Funded Research	84,632	5,889
Subtotal	104,061,000	53,260,881
Administrative Research Funds	21,165,853	18,584,892
<i>Grants</i>		
CHED Centers of Excellence / Developments	7,489,307	5,493,067
Subtotal	7,489,307	5,493,067
Total Externally Funded Research (EFR)	132,716,160	77,338,839
TOTAL RESEARCH EXPENDITURE (TRE)	345,969,614	272,159,793
TOTAL RESEARCH EXPENDITURE AS % OF OPEX	19%	16%

Note: The basis for computing the Percentage of Research was derived from the following budget:

	Budget	Actual
Total DLSU OPEX Budget AY 2012-2013	1,843,280,000	1,754,810,254
Basis *	1,843,280,000	1,754,810,254

LIST OF FUNDING AGENCIES

1. AUN/SEED-NET JICA
2. Australian Agency for International Development (AusAID) through Oxford University, UK
3. Biohitech Co., Ltd.
4. ERDT
5. International Development Research Centre (IDRC)
6. Philippine Council for Industry and Energy Research and Development Department of Science and Technology
7. AECOM Phli. Cosultants Corp.
8. ANSA-EAP
9. ASEAN Secretariat
10. Asian Institute of Technology
11. Asia-Pacific Economic Cooperation (APEC)
12. AUN/SEED-NET JICA
13. Australia Agency for International Development
14. Australian National University
15. Caucus of Development NGO Networks (CODE-NGO)
16. Center for Budget and Policy Priorities CBPP
17. Center for Disaster Risk Policy of Florida State University
18. Chamber of Mines of the Philippines
19. Commission On Higher Education
20. Conservation International Foundation
21. Datacraft
22. Department of Labor and Employment
23. DLSU-AKI CBMS
24. DOST
25. DOST-Philippine Council for Advanced Science and Technology Research and Development
26. DOST-Philippine Council for Industry and Energy Research and Development
27. DOST-Science Education Institute
28. Economic Research Institute for ASEAN and East Asia
29. Food and Agriculture Organization of the United Nations
30. Global Integrity, Inc.
31. Ibanag Heritage Foundation, Inc.
32. International Development Research Centre (IDRC)-Canada and the Canadian Agency for International Development (CIDA)
33. Metro Manila Health Research and Development Consortium/Philippine for Health Research and Development (MMHRDC/PCHRD)
34. Missio Munich
35. Mr. Vicente Pacheco
36. National Academy of Sciences and the Agency of International Development (USAID)
37. National Anti-Poverty Commission UNDP
38. National Commission for Culture and the Arts (NCCA) through the DLSU Science Foundation
39. NCU, Taiwan
40. Nokia
41. National Research Council of the Philippines
42. Overseas Development Institute (ODI)
43. Philippine Council for Health and Development, DOST
44. PIDS
45. Samahan sa Pilipinas ng mga Industriyang Kimeka or SPEIK a SEED)
46. Social Sciences and Humanities Research Council, University of Columbia
47. Southeast Center for Training and Development
48. Swedish ICT for Developing Regions (SPIDER)
49. Tanggol Kalikasan
50. UNIDO
51. United Nations Development Programme (UNDP)-Manila
52. Univeriste Laval-DFID
53. UNSW c/o Mark Fogarty
54. USAID through Virginia Polytechnic Institute and the North Carolina Agricultural and Technical State University
55. World Bank
56. World Health Organization /TDR