

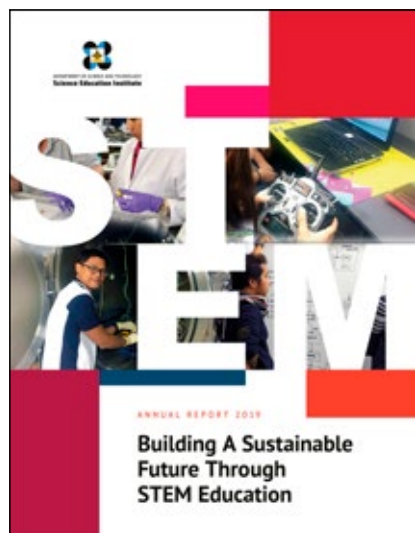


DEPARTMENT OF SCIENCE AND TECHNOLOGY
Science Education Institute



ANNUAL REPORT 2019

Building A Sustainable Future Through STEM Education



ABOUT THE COVER

A sustainable, peaceful, prosperous and equitable life for everyone is the aim of the Sustainable Development Goals (SDGs). Likewise, this principle guides us at the Department of Science and Technology – Science Education Institute (DOST-SEI) as we develop competencies that empower learners, teachers, and other individuals with new ways of integrating scientific knowledge and skills into real-world situations. Complemented by relevant values and attitudes, our initiatives in STEM education look toward a transformative and sustainable future.

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Introduction

Building a Sustainable Culture of Science, Technology and Innovation

The principle behind the Sustainable Development Goals or SDGs is that, country-wide and worldwide, total “development” is achievable by targeting specific, overarching challenges. The DOST-Science Education Institute touches specifically on providing Quality Education, proposing measures that promote Gender Equality, Decent Work and Economic Growth, helping Reduce Inequalities in our society, and strengthening Partnerships, both local and foreign, to further the development and mobilization of our human resources for Science and Technology.

Every goal has a component related to science and scientific research, and we find that each is intertwined with all the others. Our efforts to provide children with the opportunity to access quality STEM education by realizing their individual potentials consequently helps contribute to substantially increasing the number of youths and adults who have relevant skills not only for gainful employment but also for contributing to the country’s economic growth.

Our efforts directly or indirectly impact on the other 12 Sustainable Development Goals as well, since S&T education is inextricably linked with the social and economic advancement of the country. For example, in alleviating world hunger, biotechnologies have to be at the forefront of food production and nutrition to advance the SDG goal of Zero Hunger, while climatologists likewise have to impart their knowledge and expertise to help us understand and adapt to Climate Change, which impacts our resilience and sustainability on this planet.

To make these goals effective, our policymakers, educators, scientists and the rest of the stakeholders of this global agenda must be able to apply them at the local level. Our issues in the Philippines range from the growing population to planning and implementing a sustainable and inclusive economy, promoting global competitiveness, and mitigating the effects of environmental degradation, among others.

More often than not, it takes scientists to gather the data, conduct studies, identify the cause of the problems and propose solutions. This is why we need to work hard to ensure that the Philippines has enough human resources – scientists, engineers and researchers – because their presence makes all the difference whether our country will progress or not.

Education has always been the key to achieving this, just as it has done for centuries. As the main engine of development, education supplies countries with the human resources that, through data, help policymakers make good judgements. In a deeper and more encompassing manner, education also helps develop the citizenry’s scientific literacy.

While the SEI and the DOST are intensifying efforts to ensure quality education for all Filipino students, we as a country are still far from putting science, technology and innovation at the centerpiece of our national strategy. With 270 scientists per million (the ideal being 380 per million), the Philippines has to overcome this challenge, along with more local investments to absorb our human resources, in order to respond to the calls for rapid, inclusive and sustainable growth and development.

Our commitment to meet these challenges has never been higher, and guided by the visions of the SDGs, we remain true to the path of making science serve society.

Message from the **SECRETARY**

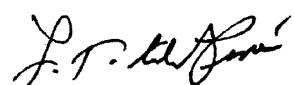
The socioeconomic challenges that we face as a nation today have profoundly accentuated the cumulative role of science and innovation in achieving continued national advancement. This has urged the administration to constantly reevaluate the country's overall economic productivity and technological capabilities, ensuring that we generate equal opportunities for all members of society.

As we strive to meet the targets slated in the 2030 United Nations agenda within this next decade, we have embarked on several transformative structural reforms and accelerated technology transfer to usher in an economy of inclusivity and sustainability. While we are making headway in increasing employment rates, including for the marginalized sector in social and educational programs, and curtailing inequalities in science, technology, and innovation (STI) capacities, there is still a gap that needs to be closed to truly carry our nation forward.

The utilization of research in responding to cross-cutting issues, expansion of STI facilities, and enhancement of S&T human resources remain at the forefront of the Department of Science and Technology's contribution to spur exponential growth and thus elevate our global stature. We continue to mandate the Science Education Institute (SEI) to set a strategic roadmap for S&T scholars and educators as we further upgrade technological infrastructure and build progressive educational systems.

With the Institute's commitment to strengthen the Filipinos' intellectual capital through dynamic STI adaptations, the Science, Technology, Engineering, and Mathematics (STEM) curriculum, and relevant government-industry-academia collaborations, I am confident that we can further promote efficient STI governance, produce more competent S&T professionals, and therefore drive our nation toward sustainable development.

The DOST, together with the tireless support of our partners and stakeholders, will continuously pursue results-focused research and lay solid foundations for S&T in our country to establish a more inclusive and enabling society for the innovators of tomorrow.



PROF. FORTUNATO T. DELA PEÑA
Secretary, Department of Science and Technology

Message from the **DIRECTOR**

With each passing year, we get closer to the target date set by the United Nations for the rest of humanity to achieve the Sustainable Development Goals. With but a decade to go, the pressure is definitely building!

In a sense, Education for Sustainable Development is in our DNA, ever since the Science Education Institute was founded over three decades ago with the mission of accelerating the development of S&T human resources in our country. And though we can proudly state our achievements in having molded generations of deserving scholars, and in having implemented innovations that have made STEM education more meaningful to our stakeholders and the public, much still remains to be accomplished, and the tasks in front of us have never been more urgent.

The SDGs call upon leaders and policymakers to make much-needed and long sought for transformation of our world. Sustainable development may be a nebulous concept, and there are numerous ways of getting there. For us, its elements lie in the ever-growing number of scholars we provide, in every project we undertake with our expanding network of partners, and in every effort to elevate and ensure the inclusivity of quality S&T education in our country.

As an agency, our mandate and our views on science education continue to expand to address sustainable development, empowerment and social transformation. Consequently, we are imparting this outlook to the youths whom we serve, transforming them into more than just beneficiaries of scholarships but also as agents that play a critical role in accelerating our collective future as a nation under the guiding vision of the SDGs.

Within these pages are recorded the details of our efforts to achieve this end. The challenges we face remain enormous, and the process of finding solutions is never ending. We are constantly adapting to a world of profound and rapid changes, a world in which we are inextricably linked, and share in the responsibility to contribute to the common vision.

We have a long way to go, yet so short a time to get there. Nevertheless, with the support of our leaders, decision makers, educators, students, and local and foreign partners, and our hardworking employees, the Science Education Institute will remain up to completing the tasks ahead.



DR. JOSETTE T. BIYO
Director, Science Education Institute

Accomplishment Highlights

Undergraduate and Graduate Scholarship Programs

9,852 qualifiers in the 2019 DOST-SEI S&T Undergraduate Scholarship examination

27,485 undergraduate scholars supported in 2019 – **17%** higher than 2018

10,528 students and teachers served in the #Push4Science campaign, **196%** increase from 2018

221 MS and **31** PhD scholars supported under the Project Science and Technology Regional Alliance of Universities for National Development (STRAND); inclusion of the Mindanao State University-Main Campus among its current delivering higher education institutions

4,278 MS and **1,563** PhD scholars have been served under the Capacity Building Program in Science and Mathematics Education (CBPSME), the Accelerated Science and Technology Human Resource Development Program (ASTHRDP) and the Engineering Research and Development for Technology (ERDT) programs

205 graduating students attended mentoring program to improve scholarship availment

53% increase in number of supported scholars pursuing MS and PhD programs abroad through the Foreign Graduate Scholarship Program in Priority S&T Fields

56 Masters degree & **6** PhD scholars being supported by the Philippine-California Advanced Research Institutes (PCARI) Project

168 DOST employee-scholars received local graduate scholarship under the DOST-Human Resources Development Program (DOST-HRDP)

5 MS and **4** PhD DOST employee-scholars received support for their graduate studies in Bulgaria, France, Hungary, Japan and Thailand

24 scholarship slots have been added with the extension of the CLM Scholarship Program offered to qualified students in Cambodia, Lao PDR, and Myanmar. The extension period starts 2019 to 2021, allocated with 8 slots per year

57% increase in the number of scholars over 2018 taking part in the third Filipino Patriot Scholars Project, which aims to foster nationalism through volunteerism

177 BS, **27** MS and **3** PhD scholars were accepted into the second year of the **Bangon Marawi Scholarship Program**. Among the first batch, **131** BS scholars already graduated from their respective degrees

Educational Conferences

442 MS and PhD scholar-graduates and faculty members from the NSC participated in the Graduate Scholars' Conference Year 8 of the Accelerated Science and Technology Human Resource Development Program-National Science Consortium (ASTHRDP-NSC)

49 oral sessions and **29** poster presentations were among the highlighted activities of the 5th National Research Conference in Science and Mathematics Education, which carried the theme “**STEM Towards Education 4.0**”

5 major events conducted by the Engineering Research and Development for Technology (ERDT) to help its scholars learn and collaborate with people from the academe, industry and government agencies

350 educators, education policy makers and experts in the Asian region attended the **1st International Conference** successfully mounted by the Science Teacher Academy for the Regions (Project STAR) to discuss and share the current state of international science and mathematics education



1st International Conference

Innovative Learning Solutions

12 more Android-based Science modules for Grades 3 to 6 were added to the free DOST Courseware package for a total of **112** mobile applications available for download from Google Play



18 more schools adopted the **21st Century Learning Environment Model** (21st CLEM) nationwide, providing more dynamic learning spaces for the 21st century learner



140 number of proposals garnered under **InnoBox**, a nationwide search for the most innovative teaching and learning resources from elementary and secondary science and mathematics teachers, nearly double the proposals submitted in 2017



4,314 students from **92** schools in Luzon and Visayas benefitted from the visit of the Science Explorer mobile learning facility. A new bus unit called “**nuLab: STEM in Motion**” was also launched in 2019

Teacher Development Initiatives

48 teachers in Region I who are non-Physics majors attended a content mastery and pedagogical skills training on the newly developed Physics modules for Grade 8, while Region IV-A teachers in small private schools underwent training on *Numbers and Number Sense for Grades 5&6*

50 science and mathematics teachers, principals, supervisors and focal persons of indigenous communities from Regions I and III attended a seminar-workshop on *Indigenization in Science and Mathematics Education* in Angeles City, Pampanga

80 scholar-graduates under the **JLSS (Junior Level Science Scholarship) program** attended a four-day *Capacitating Scholar-Graduates with Pedagogical Skills training to strengthen their teaching skills* with practical and innovative approaches in teaching science and mathematics

39 teachers from Regions III, IV-A and NCR participated in the workshop *Disability-Inclusive Training in Science and Mathematics Education*, to develop adaptive instructional materials in teaching mathematics for Grades 2, 3, and 4 students who are visually impaired/blind

74 teachers nearing retirement went through an empowerment training to inform them of health-related scientific advances, impart disaster-coping skills, and promote microentrepreneurship

1,334 science and mathematics teachers benefitted from the Project **STAR training session** series designed to enhance their teaching capacity

National and Global Competitions

6 members of the Philippine contingent to the **60th International Mathematical Olympiad** (IMO) each received medals consisting of one silver and five bronzes against more than 600 other contestants in the competition held in Bath, United Kingdom

1,631 Another record breaking number of **Youth Excellence in Science** (YES) awardees in 2019, with gold, silver, and bronze medalists in prestigious international Science & Technology Engineering and Mathematics (STEM) competitions throughout the year

2,387 The country's total tally of gold, silver, and bronze medals from over 84 global **STEM** competitions, a **3.42%** increase from 2018

84 proposals drawn by the “**imake.wemake: create. innovate. collaborate**” 3rd year of competition

31,744 number of viewers across the country who attended the **2019 Science Film Festival**, which featured past winners of Indie-Siyensya filmmaking competition

16 public high schools went through 7 rounds of elimination matches in the **Tagisang Robotics competition** which resumed in 2019

200+ students and other guests attended the opening ceremony of the **4th Indie-Siyensya Science Filmmaking Competition** held at the Iloilo Convention Center

40 students and **20** teachers from selected schools in Lanao del Norte, Davao, South Cotabato and Agusan del Norte joined the Climate Science Youth Camp held at the Island Garden City of Samal, Davao del Norte



EQUITABLE OPPORTUNITIES TO QUALITY EDUCATION

SECTION

1

For a nation to truly forge ahead in achieving sustainable development, strategic frameworks that gear toward social inclusion (SDGs 4, 5 and 10) and high economic productivity (SDG 8) are crucial.

For this reason, the Institute helps dismantle barriers to education with a strong focus on ever increasing its provisions for scholarship slots at the undergraduate and graduate levels, equipping academic institutions with the capacity to engage students, and inspiring the Filipino youth to take up careers in science and technology.

In this section you will find how the following activities contribute to substantially increasing the number of youths who have relevant skills in various scientific fields of study for employment -- and how the Institute helps even those from other developing countries as we adopt a global perspective towards offering quality education for all.

SECTION 1 SDG CATEGORY AND ACTIVITIES

	4 QUALITY EDUCATION	5 GENDER EQUALITY	8 DECENT WORK AND ECONOMIC GROWTH	10 REDUCED INEQUALITIES	17 PARTNERSHIPS FOR THE GOALS
UNDERGRADUATE AND GRADUATE SCHOLARSHIP PROGRAMS	👍		👍	👍	
FOREIGN SCHOLARSHIP PROGRAMS	👍		👍	👍	👍
EMPLOYEE ENHANCEMENT SCHOLARSHIP PROGRAMS	👍		👍	👍	👍
FORUMS AND CONFERENCES	👍			👍	👍
CONNECTIVITY, SECURITY AND TRANSPARENCY ENHANCEMENTS					👍

UNDERGRADUATE AND GRADUATE SCHOLARSHIP PROGRAMS

Undergraduate scholarship beneficiaries maintain record-breaking numbers

For the past five years, the Institute has been breaking records annually in the number of undergraduate scholarship beneficiaries. In 2019, a total of 9,852 qualified in the 2019 DOST-SEI Undergraduate Scholarship examination conducted on October 20, 2018, where 5,819 qualified under the RA 7687 Scholarship program and 4,033 qualified for the Merit program.

This achievement is 10 percent higher than 2018 qualifiers, bringing the total number of scholars supported by DOST-SEI to 27,485 or 17 percent greater than the 23,531 scholars recorded in the previous year.

The increase in the number of scholarship beneficiaries resulted from the continuous effort of the DOST-SEI in conducting its massive advocacy campaigns for STEM and its various scholarship programs, with support from DOST Regional Offices; from the expansion of the number of study placements where the scholars can



Applicants of the 2020 DOST-SEI S&T Undergraduate Scholarships while waiting for the evaluation of their application forms



Senior High School students taking the 2020 DOST-SEI S&T Undergraduate Scholarship Examination at the University of Southeastern Philippines – Tagum

The #Push4Science Campaign Team fills the venues and conducts sessions in the open to accommodate the number of students and teachers interested to learn about the DOST-SEI Undergraduate and Graduate Scholarship Programs



enroll in; and from the addition of degree programs covered under the DOST-SEI Undergraduate Scholarship Programs.

SEI continues to make headway into providing support to graduate level scholars. In 2019, 4,278 MS and 1,563 PhD scholars have been served under the Capacity Building Program in Science and Mathematics Education (CBPSME), the Accelerated Science and Technology Human Resource Development Program (ASTHRDP) and the Engineering Research and Development for Technology (ERDT) programs.

#Push4Science campaign extends reach

The scholarship campaign project “#Push4Science: Maging DOST Scholar Ka!”, ongoing since 2014, continues to gain greater ground and consequently attract more scholars every year.

In 2019, the campaign reached 63 municipalities from nine regions encompassing the provinces of Surigao del Sur, Antique, Masbate, Agusan del Sur, Iloilo, Batangas, Laguna, South Cotabato as well as Metro Manila. It served 10,528

students and teachers, a 196 percent increase from the previous year’s (2018) 3,561 target audience reached.

The campaign followed the same *promote-inspire-persuade* framework and engaged senior high school and college students enrolled in priority S&T courses in career talks, inspirational dialogues with ongoing scholars and scholar-graduates, interactive activities, and a detailed scholarship orientation on Republic Act 7687, Merit, and the JLSS Programs.

The Campaign also developed new materials such as radio plugs and audiovisual presentations featuring outstanding scholar-graduates, and handed out application forms to students and school officials. It simplified the information on the whole process of applying for the scholarship programs, and highlighted the opportunities available in the fields of STEM.

For the other municipalities that were not directly reached, Scholarship Campaign Kits were provided to the Provincial Science & Technology Centers (PSTCs) of the various DOST Regional Offices and the university officials for their respective scholarship caravans and other events. Posters, brochures and other collaterals were also distributed during the National Science and Technology Week (NSTW) celebrations in Davao City and in Metro Manila, as well as in regional S&T fairs.

DOST-SEI expands capabilities of Project STRAND

The project Science and Technology Regional Alliance of University for National Development (STRAND) continues to gain headway towards supporting the country's commitment to providing equitable educational opportunities in higher education institutions (HEI) in the provinces.

In 2019, it supported a total of 221 MS and 31 PhD scholars. In addition, there were two scholars and faculty members of the Palawan State University who are currently pursuing their PhD at the Universiti Teknologi Petronas (UTP) in Malaysia. Another cohort of seven MS and six PhD program applicants were awarded scholarships to pursue Energy Engineering and related fields at UTP in January 2020.

New STRAND qualifiers from the Central Mindanao University pose for a group picture after the Orientation on Scholarship Policies and Signing of the Scholarship Agreement

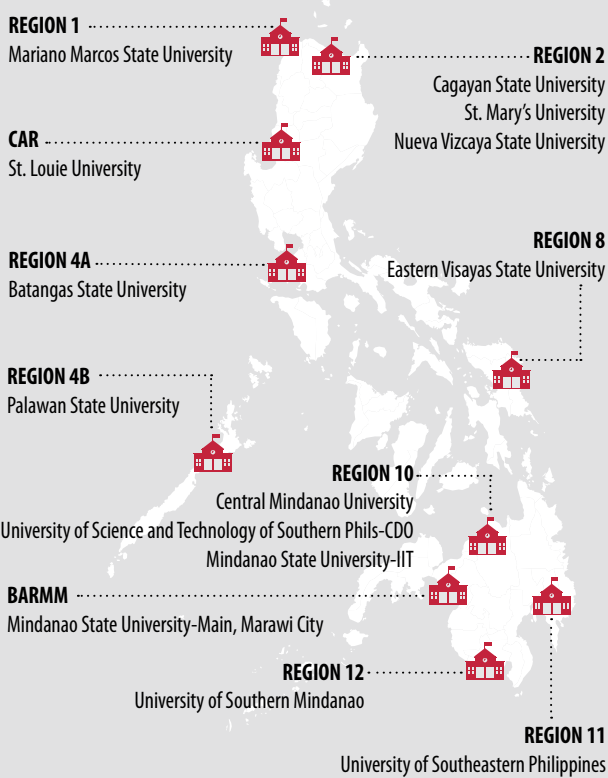


FIGURE 1:
HIGHER EDUCATIONAL INSTITUTIONS
IN THE REGIONS IMPLEMENTING PROJECT STRAND

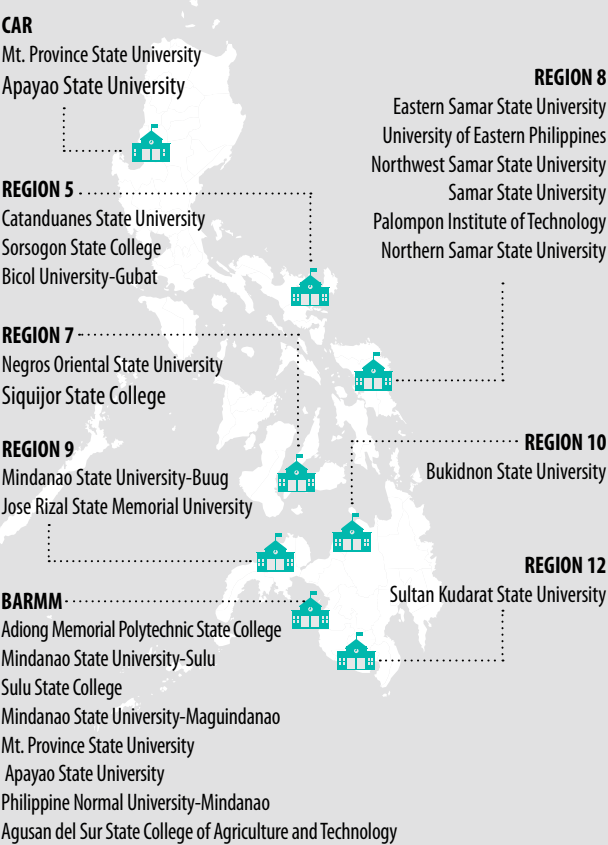


FIGURE 2:
LIST OF NEW HIGHER EDUCATION INSTITUTIONS
FOR INCLUSION IN PROJECT STRAND

The project addresses the need to expand the capabilities of HEIs to provide DOST-SEI graduate scholarships in STEM courses. It also aims to provide S&T professionals in the regions access to advanced degree studies and eventually spur research and development activities that contribute to the country's global competitiveness and economic development.

On June 24, 2019, DOST-SEI approved the inclusion of the Mindanao State University-Main in Marawi City for the following programs: MS Biology, MS Mathematics, and MS Physics. Figure 1 shows for the current list of HEIs involved in the project.

In line with SDG 17's goal of promoting partnerships for a sustainable future, and with the aim of substantially increasing the supply of qualified

teachers under SDG 4, DOST-SEI expanded the Project STRAND to include universities located in 20 provinces identified by the National Economic Development Authority (NEDA) as the poorest of the poor provinces of the country. Although these universities have a significant number of enrolled DOST-SEI undergraduate scholars, their faculty do not meet the minimum requirement of having a Master's degree to qualify them to teach S&T courses.

Starting AY 2020-2021, DOST-SEI will undertake capacity building in several state universities and colleges to ensure quality tertiary education in the DOST-SEI identified fields of study by granting scholarships to their faculty members and providing intervention programs to fast-track the strengthening of the S&T programs they offer. Figure 2 shows the list of new Project STRAND HEIs.

Science and Mathematics Education Consortium gains more faculty-scholars in TEIs

Under the Capacity Building Program in Science and Mathematics Education (CBPSME), DOST-SEI, in cooperation with the National Consortium in Graduate Science and Mathematics Education (NCGSME), supported 739 MS and 453 PhD scholars during the year in review. Out of these, 159 MS and 41 PhD scholars have completed the program.

This program intends to provide more and better qualified S&T faculty members in Teacher Education

Institutions (TEIs), delivered by 16 universities that constitute the National Consortium on Graduate Science and Mathematics Education (NCGSME). These universities are: 1) Ateneo de Manila University (ADMU); 2) Bicol University (BicolU); 3) Central Luzon State University (CLSU); 4) De la Salle University (DLSU); 5) Mariano Marcos State University (MMSU); 6) Mindanao State University-Marawi (MSU-Marawi); 7) Philippine Normal University (PNU); 8) University of San Carlos (USC); 9) West Visayas State University (WVVSU); 10) Western Mindanao State University (WMSU); 11) Leyte Normal University; 12) Saint Mary's University; 13) Mindanao State University-IIT; 14) Cebu Normal University; 15) UP Open University; and 16) UP College of Education, Diliman.

A total of 265 scholars and faculty members from the Consortium attended the 5th National Research Conference in Science and Mathematics Education with the theme "STEM Toward Education 4.0" held in Legaspi City from February 28 to March 1, 2019.

The Keynote Address was delivered by Mr. Johnson Ong Chee Bin, and his topic was ASEAN University Network (AUN) Quality Assurance Expert Singapore. The Plenary Speakers were: Dr. Imelda S. Caleon, Senior Research Scientist, Centre for Research in Pedagogy and Practice National Institute of Education (NIE), Nanyang Technological University (NTU), Singapore; and Dr. Ian June L. Garces, Associate Professor, Ateneo de Manila University.

Participants of the DOST-SEI-CBPSME 5th National Research Conference in Science and Mathematics Education pose for a group picture



(top to bottom)

Mr. Johnson Ong Chee Bin, AUN-QA Expert in Singapore, and Dr. Josette T. Biyo, DOST-SEI Director lead the ceremonial cutting of ribbon to signify the opening of the Poster Exhibit

Prof. Fortunato T. De La Pena, DOST Secretary delivers an inspirational message to the scholars, guests and participants

Ms. Melodee T. Pacio, MS Science Education scholar at ADMU, presents the output of her thesis in one of the parallel oral sessions





Mr. Domart Ace Duque, PhD SciEd scholar at DLSU explains his research to Dr. Josette T. Biyo

FOREIGN SCHOLARSHIPS

DOST-SEI ramps up foreign scholarship support

In its desire to ensure inclusive and quality education to the Filipino people, particularly in emerging technologies that will be beneficial to the nation, the DOST-SEI has ramped up its Foreign Graduate Scholarship Program in priority S&T Fields. The Institute collaborates with universities and foreign governments to build the

capacities of Filipino professionals who wish to pursue MS or PhD programs abroad.

Qualified applicants to the scholarship program are enrolled in reputable universities abroad to ensure that they receive the best quality education in their respective fields of specialization.

Among the fields identified as priority under the program are: Agriculture (with specialization in Agronomy, Animal Science, Entomology, Horticulture, Plant Breeding, Plant Pathology, Soil Science, Taxonomy, Veterinary Medicine and Veterinary Entomology), Analytical Chemistry, Artificial Intelligence, Atmospheric Science, Bioethics and Data Privacy, Biomedical Engineering, Chemical Biology, Combinatorial Chemistry, Data Science, Earth Science, Ethnomedicine, Ethnopathology, Genetic Epidemiology, Health Financing, Immersive Technology, Marine Science, Medical Entomology, Medical Physics, Medicinal Chemistry, Meteorology, Metrology, Molecular Biology and Biotechnology, Natural Products Chemistry, Nuclear Science and Engineering, Organic Chemistry, Public Health Entomology, Rehabilitation Medicine, Robotics, Space Technology and Application/Aerospace and Virology.

In 2019, the DOST-SEI supported 27 scholars, a 53-percent increase from 2018, to pursue their MS and PhD degrees in various universities abroad. (See Figure 3)

Upon completion of their scholarship program, the scholars are expected to return to the country and render the required service obligation at twice the length of their scholarship duration.

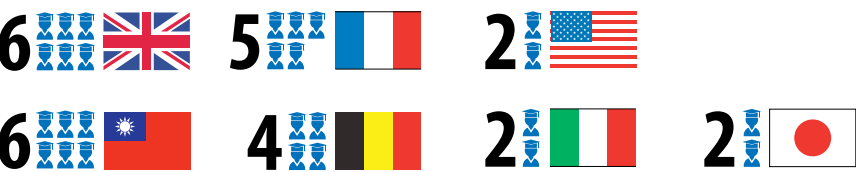


FIGURE 3:
NUMBER OF SCHOLARS AND THE COUNTRIES WHERE THEY ARE PURSUING GRADUATE DEGREES

GRADUATES and TESTIMONIALS

Before the end of 2019, the program has produced two MS graduates: one in Deglutology and another in Manufacturing Technology and Management. The following documents the experiences of the graduates and their testimonials on the benefits of being a foreign scholar:

“Through DOST’s support, I was able to study in Katholieke Universiteit Leuven (KU Leuven), Belgium, which belongs among the Top 50 universities worldwide and has consistently been recognized as Europe’s most innovative university due to its extensive research programs. I am optimistic that through the clinical and research training as well as the expanded professional network I gained abroad, I can contribute to DOST’s goal of developing innovative technologies, products, and research to help achieve the Sustainable Development Goals (SDG) in the Philippines.”

MR. HOWELL HENRIAN G. BAYONA
MS in Deglutology, Magna Cum Laude
Date of Graduation: July 2019

“As one of the global leaders in research, teaching and delivery of all aspects plant science, I am very fortunate to be given this opportunity to learn and work with the best in the field. My utmost gratitude and appreciation goes to DOST-SEI, UPLB College of Agriculture and Food Science (CAFS), and DOST-PCAARRD for all the support.”

MR. ARLAN JAMES D. RODEO
University of California Davis, USA
PhD in Agriculture
(Postharvest Biotechnology)

During a tour at the demonstration area of the Horticulture Innovation Lab as part of the 2019 Postharvest Technology Short Course at UC Davis.



MR. CARLO MIGUEL C. SANDOVAL, PhD student in Biochemistry with specialization in Molecular Biology and Biotechnology was granted a 3-year scholarship grant at the University of Cambridge in Cambridge, England, United Kingdom. He was among the first batch to be awarded the scholarship grant.

Mr. Sandoval's PhD research is on the molecular genetic aspects of gas vesicle formation in enterobacteria. Gas vesicles are intracellular buoyancy chambers enabling cells to float in static columns and are therefore both biophysically and environmentally important for cognate bacteria. In this photo, he is screening a transposon mutant library for strains with defective gas vesicle phenotypes



Another scholar-grantee in the United Kingdom is **MR. CHUCKIE FER A. CALSADO** who pursued a 3-year Ph.D. in Bioethics Education degree at the University College London – Institute of Education (UCL-IOE) in London, United Kingdom.

Mr. Calsado was able to present his research topic in an international conference where he talked about the aims of his research in the development of a critical bioethics education which uses a decolonizing framework in addressing issues that the discipline tries to confront



Ellyn Chua assisting people with post-stroke aphasia in using iPads to make "video poems"; she participated in this weekly activity for a month to learn about how people with aphasia use technology



“Through my participation in the fortnightly meetings of an AAC user support group affiliated with the university (most of the members of which are adults with cerebral palsy), I got to interact with actual PWDs who use high-tech AAC to communicate everyday. These interactions made me realize that involving end-users directly in any technological development endeavor is valuable. They also made me realize that PWDs here in the UK and in the Philippines face very similar barriers to accessing technology (or even availing related services), so it could be worthwhile for countries to learn from each other's assistive technology policy problems and solutions.”

MS. ELLYN CASSEY K. CHUA
University of Dundee in Scotland,
United Kingdom
*MS in Augmentative and
Alternative Communication*



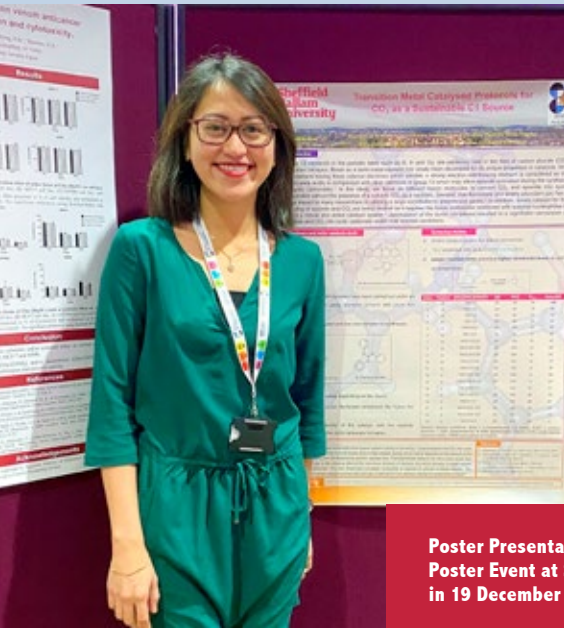
(above)
Advanced Drug Development Class with Doctor Yuichi Sugiyama (Left, sitting down, wearing a blue shirt) from Riken, a large scientific research institute in Japan



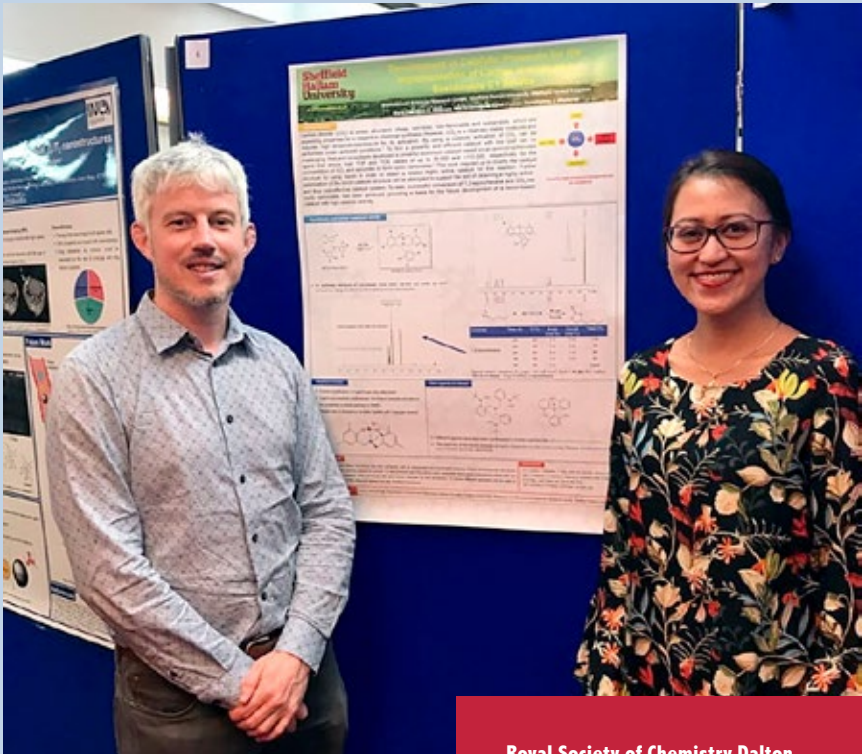
(left)
During the talk of Professor Shigeru Toyoda, former Chief Executive Officer in one of the top companies in Japan marketing a breakthrough antacid to the world market that is still currently being used

MS. KATHRINE ANNE M. FLORES
Josai University in Saitama, Japan
MS in Pharmaceutical and Health Science

MS. MARIA DISTRESSA G. BILLACURA was granted a 3-year PhD in Chemistry (Materials Science) at the Sheffield Hallam University, United Kingdom.



Poster Presentation at BMRC & MERI Winter Poster Event at Sheffield Hallam University in 19 December 2019



Royal Society of Chemistry Dalton Division Northern Regional Meeting 2019 as Poster presenter in York, United Kingdom on June 13, 2019



MR. EMMANUEL L. BERNARDO is a Ph.D. in Plant Sciences student with a 3-year scholarship grant at the University of Cambridge in Cambridge, United Kingdom. His research entitled “Photoautotrophic Micropropagation as A Platform to Model and Predict the Morpho-Physiological Adaptations of C4 Species in A Changed Climate” was started in April 2019.

“ Postharvest Horticulture is my specialization which is a field involved in the preservation of horticultural crops in their fresh form from harvest until it reaches the consumer. I am an advocate of sustainable agriculture and cutting our food losses due to spoilage has become my passion and research interest. My fortunate acceptance to one of the top and innovative universities in the world has opened doors for me in harnessing my expertise and gaining new skills that I have never dared tried before. ”

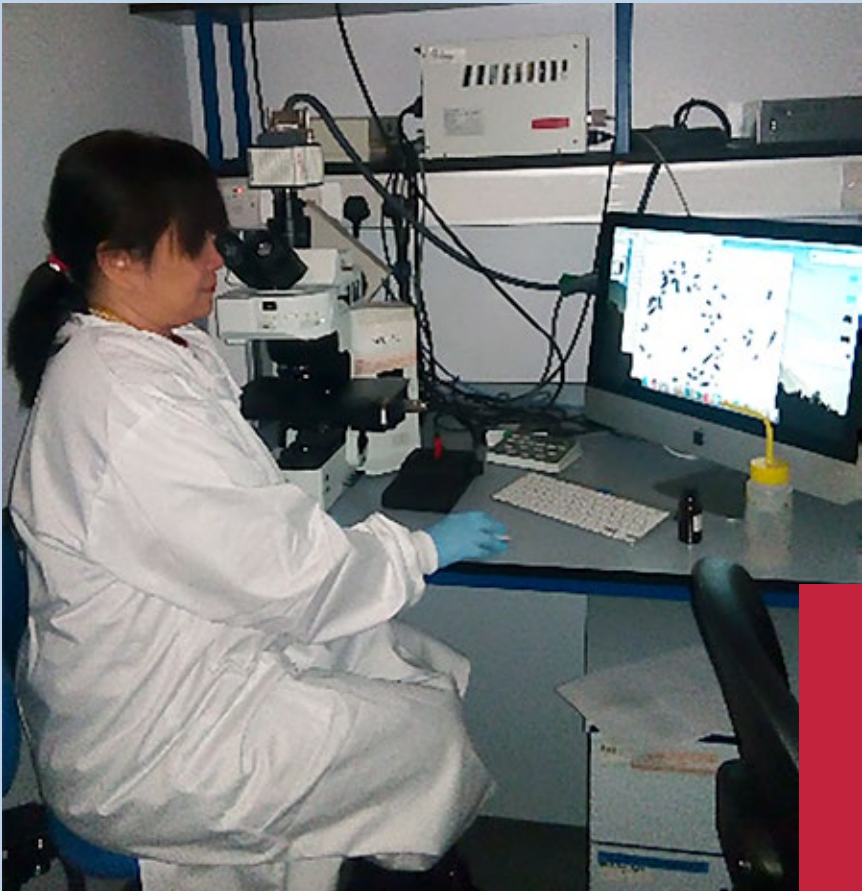
MR. ANGELO C. CASTRO was granted a 3-year scholarship to the Katholieke Universiteit Leuven (KU Leuven) in Leuven, Belgium to pursue a Ph.D. in Bioscience Engineering beginning January 2019. His research is focused on developing a detection method for a texture disorder in blueberries called mealiness, determine its causes, understand its development at the biochemical and physiological level and utilize controlled atmosphere (CA) technologies to prevent its occurrence.



(right)
The KU Leuven Central Library where Mr. Castro conducts research during weekends

(below)
Presenting a seminar on cell wall biochemistry and its role in the juiciness character of fruits





MS. MARIE ROSELLYN C. ENGUITO was granted a 3-year scholarship to pursue her Ph.D. in Genetics with specialization in Molecular Biology and Biotechnology degree at the University of Kent in Canterbury, United Kingdom.

(left)
Laboratory Training at University of Kent

(below)
Laboratory Work at Kasetsart University, Thailand



MYO THANT KYAW
Myanmmar

I finished my Bachelor in Agricultural Science degree at Yezin Agricultural University, Myanmar in 2017. One of my friends who finished a Ph.D degree in UPLB told me that the Philippines is offering graduate scholarships in selected Philippine universities such as DLSU-Manila, UP-Diliman, UPLB and UP-Manila.

When I knew that Environmental Science was one of the priority courses under the scholarship program, I took my time in accomplishing the application form and other requirements. Then, a team from Manila headed by Dr. Josette T. Biyo from DOST-SEI went to the Embassy of the Philippines in Myanmar to conduct the interview of applicants on December 8, 2017. I luckily hurdled the interview, and was thankful that my parents supported and allowed me to study abroad. It was my first time going out of the country.

The faculty and staff are very supportive to their students. I am also grateful to DOST-SEI for the timely release of financial assistance and full academic and moral support to the scholars. After finishing my MS degree in UPLB, I plan to apply for a job in Myanmar where I can use and apply my expertise in environmental science. After 10 years of experience, I plan to put up my own company so that I can also share my skills and employ people as a return service to my country for the scholarship provided to me by DOST-SEI.

My piece of advice to the fellow students from Myanmar who also want to pursue graduate degrees in the Philippines are to equip themselves with the English language, focus on your goals but balance your academic life with other things that make you happy.



In 2019, PCARI Project supported a total of 53 local MS and 2 local PhD scholars as well as 3 foreign MS and 4 foreign PhD scholars.

TABLE 1:
NUMBER OF PCARI SCHOLARS BY SCHOOL AND DEGREE PROGRAM

Training Institutions	Local		Foreign		Total	
	MS	PhD	MS	PhD	MS	PhD
University of the Philippines Diliman	41	2			41	2
University of the Philippines Los Banos	2				2	0
University of the Philippines Manila	2				2	0
Ateneo de Manila University	3				3	0
De la Salle University	3				3	0
Mapua University	2				2	0
University of California Berkeley			1	2	1	2
University of California San Francisco			2		2	0
University of California Merced				1	0	1
University of California Davis				1	0	1
TOTAL	53	2	3	4	56	6

PCARI Project supports more scholars

The Philippine-California Advanced Research Institutes (PCARI) Project has two major integral components: 1) human resource development (HRD) and capacity building in research and development, particularly in the areas of information infrastructure development (IID) and health innovation and translational medicine (HITM); and 2) the actual production of new knowledge in these fields where Philippine scientists and researchers show much promise, based on their track records like publication in scientific journals and patent applications. The PCARI Project is unique in that it involves convergence of training and research.

Specifically, the PCARI Project, through its Institute for Health Innovation and Translational Medicine (IHITM), focuses on developing robust research, policy and clinical capacity within the Philippines as an engine for long-term development, while providing a venue for introducing new methods of device, diagnostic and drug development, testing and implementation of high quality, cost-sensitive models of delivering healthcare, and improving the health and economic potential of the Philippines.

The Institute for Information Infrastructure Development (IID), meanwhile, focuses on generating the required number of scientists, researchers, and engineers needed to drive the Philippine ICT Industry's growth. Upon completion of their studies/training, the scholars will further train other students and engineers – creating a multiplier effect and helping to ensure adequate supply of highly competent human resources that will strengthen the Philippines' position in today's knowledge-based global economy.

In 2019, it supported a total of 53 local MS and two local PhD scholars as well as three foreign MS and four foreign PhD scholars. (see Table 1)

In the same year, it produced nine MS and one PhD graduates. Two local MS scholars from UP-Diliman have undergone Sandwich Program at the University of California Berkeley Marvell Nanofabrication Laboratory. (see Table 2)

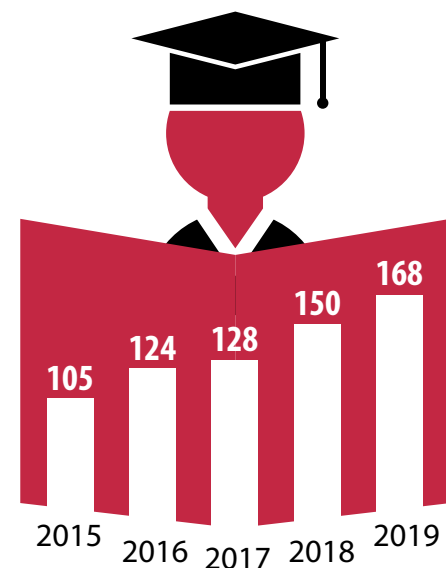
Ms. JAMELA N. PANGASINAN and Mr. ROGIE M. MADULA, PCARI local MS scholars at the University of the Philippines under the MS in Materials Science and Engineering program undertook their Sandwich Program at the Marvell Nanofabrication Laboratory under the supervision of Dr. Liwei Lin of the Department of Mechanical Engineering, University of California Berkeley, United States of America in March to August 2019



EMPLOYEE ENHANCEMENT PROGRAMS

**TABLE 2:
NUMBER OF PCARI SCHOLAR-GRADUATES BY DEGREE COURSE AND
DEGREE PROGRAM**

Training Institution	Degree Program	Local		Foreign		Total	
		MS	PhD	MS	PhD	MS	PhD
UP Diliman	MS in Environmental Engineering	2				2	0
	MS in Biology	1				1	0
	MEngineering – Electrical Engineering	1				1	0
UP Manila	Master in Clinical Audiology	1				1	0
ADMU	MS in Electronics Engineering	1				1	0
UP Diliman	PhD in Chemical Engineering		1			0	1
UC Berkeley	MEngineering – Materials Science and Engineering			1		1	0
UC San Francisco	Master of Clinical Research			1		1	0
	Master in Translational Medicine			1		1	0
TOTAL		6	1	3	0	9	1



**FIGURE 4:
NUMBER OF DOST-HRDP SCHOLARS SUPPORTED
FROM 2015-2019**

More employees of DOST and agencies receive scholarship grants

To address the human resource requirements for capacity building of DOST and its agencies, the Institute implements the degree component of the Human Resource Development Program (DOST-HRDP). This includes provisions for Local Scholarships, Foreign Scholarships, Incentives for Self-financed Graduates, Bar Review Grant, Sandwich Program, and Student Research Support Fund.

Local Scholarships

In 2019, the number of scholars supported by the program continued to increase with the implementation of the customized Master in Business Analytics off-campus program for DOST employees who are directly involved in data management and the Master's and Doctorate Program for the teaching and non-teaching personnel of the PSHS System. *(see Figure 4)*

In 2019, 43 new scholars were added for a total of 168 grantees. Table 3 shows their distribution by Agency and Degree Program.

Foreign Scholarship Program

In 2019, the DOST-HRDP supported the graduate studies of five MS and four PhD scholars in Bulgaria, France, Hungary, Japan and Thailand. The Foreign Graduate Degree Assistance is granted to selected DOST employees subject to the availability of counterpart funding from external sources and to the requirements of the DOST and the sponsoring agency. *(See Tables 4 & 5)*

**TABLE 3:
DISTRIBUTION OF DOST-HRDP SCHOLARS BY
AGENCY AND DEGREE PROGRAM**

NO.	AGENCY	NO. OF SCHOLARS		TOTAL
		M/MA/MS	D/PhD	
1	DOST-CO	12	2	14
2	ASTI	1	1	2
3	FNRI	6	4	10
4	FPRDI	2	2	4
5	ITDI	13	4	17
6	MIRDC	7	1	8
7	PNRI	8	2	10
8	PCAARRD	9	10	19
9	PCHRD	6	-	6
10	PAGASA	3	-	3
11	PSHS-MAIN	3	3	6
12	PSHS-IRC	-	1	1
13	PSHS-CVC	1	3	4
14	PSHS-BRC	-	3	3
15	PSHS-EVC	-	2	2
16	PSHS-WVC	-	2	2
17	PSHS-SMC	-	1	1
18	PSHS-CMC	-	1	1
19	PSHS-CRC	5	-	5
20	STII	2	1	3
21	TAPI	3	-	3
22	NAST	3	-	3
23	NRCP	-	1	1
24	SEI	1	-	1
25	DOST-NCR	5	-	5
26	DOST II	1	-	1
27	DOST III	2	-	2
28	DOST IV-A	1	-	1
29	DOST IV-B (MIMAROPA)	1	-	1
30	DOST V	-	1	1
31	DOST VI	2	3	5
32	DOST VII	1	1	2
33	DOST VIII	5	4	9
34	DOST IX	1	-	1
35	DOST X	3	-	3
36	DOST XI	2	1	3
37	DOST XII	2	-	2
38	DOST CARAGA	-	3	3
TOTAL				168

Self-financed Graduate Degree

DOST employees, who during their employment at DOST, were able to obtain their advanced degrees as self-financed students were granted Certificates of Merit plus cash incentives amounting to P60,000.00 to P120,000.00 for Doctorate and P40,000.00 to P80,000.00 for Master's.

In 2019, DOST-HRDP awarded the said grant to four Master's and two Doctorate self-financed DOST employees. Table 6 presents their distribution per agency.

**TABLE 4: DISTRIBUTION OF GRANTEES BY AGENCY
(NEW AND ON-GOING SCHOLARS)**

Agency	No. of Scholars		Total
	M/MA/MS	D/PhD	
DOST REGION IV-B	1*	-	1
ITDI	2	1	3
PNRI	1	-	1
PAGASA	-	1*	1
PCAARRD	1	1	2
PSHS-Main Campus	-	1	1
Total	5	4	9

** New Grantees*

TABLE 5: DISTRIBUTION OF GRANTEES BY PLACE OF STUDY			
Country	No. of Scholars		Total
	M/MA/MS	D/PhD	
Bulgaria	1	-	1
Hungary	1	-	1
Japan	-	2	2
Thailand	3	2	5
Total	5	4	9

TABLE 6: DISTRIBUTION OF GRANTEES BY AGENCY (NEW AND ON-GOING SCHOLARS)			
Name	M/MA/MS	D/PhD	Total
DOST-NCR	1	-	1
ASTI	1	-	1
PSHS-Main Campus	1	-	1
PSHS-Central Luzon Campus	1	-	1
PSHS-Western Visayas Campus	-	2	2
Total	4	2	6

Sandwich Program

MS. BIN JEREMIAH D. BARBA, an employee of the Philippine Nuclear Research Institute pursuing Master of Science in Chemistry at the De La Salle University was awarded the DOST-HRDP Sandwich Program.

Ms. Bin Jeremiah D. Barba conducting Surface Modification of Abaca Fabric via Radiation-induced Graft Polymerization for Reinforcement of Polymer Composites at the National Institutes of Quantum and Radiological Science and Technology (QST), Takasaki Advanced Radiation Research Institute (TARRI) in Gunma, Japan



Student Research Support

A. Paper Presentation

Five scholars were awarded the Dissemination Grant, a component of the Student Research Support provided to DOST-HRDP scholars whose thesis or dissertation has been accepted for oral or poster presentation in a local or international conference or for publication in a referred technical journal.

GOYENA, EVA A.

Senior SRS, FNRI
PhD in Nutrition
UP Los Baños

Research Title: "Effects of Micronutrient Powder and Complementary Food Blend on Growth and Micronutrient Status of Filipino Rural Children: A Randomized Controlled Trial"

7th Seoul International Congress of Endocrinology & Metabolism (SICEM 2019)
April 18-21, 2019

Ms. Eva A. Goyena during the presentation of her research in Seoul, South Korea



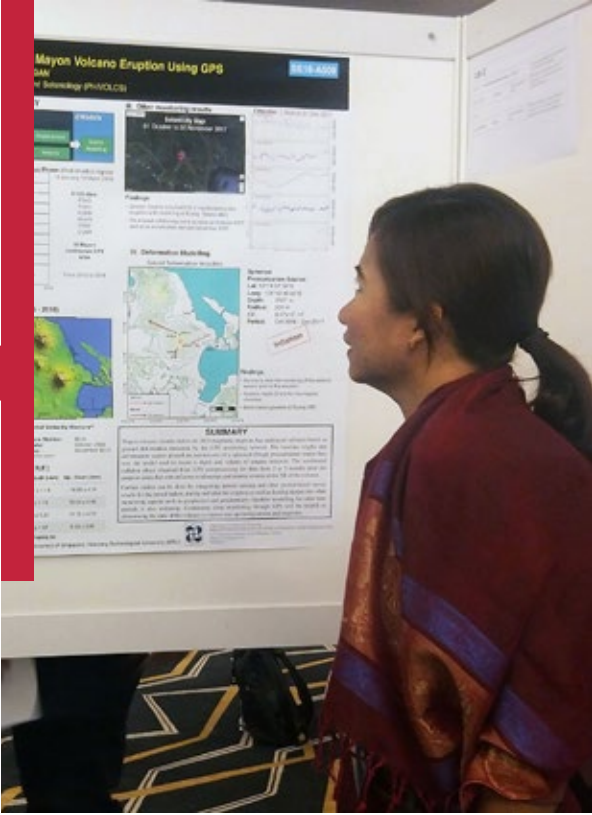
VILLAMIL, CHARMAINE V.

Senior SRS, PHIVOLCS
Master of Science in Development Communication
UP Los Baños

Research Title: "Factors that Influence the Behavioral Intention of Residents of Barangay Pembo, Makati City, Philippines to Relocate from the West Valley Fault"

Asia Oceania Geosciences Society (AOGS)
16th Annual Meeting, July 28-August 2, 2019

Ms. Charmaine V. Villamil during the presentation of her research in Singapore



B. Publication

A research entitled "Effects of Micronutrient Powder and Complementary Food Blend on Growth and Micronutrient Status of Filipino Rural Children: A Randomized Controlled Trial" by Ms. Eva A. Goyena, Senior SRS of the Food and Nutrition Research Institute (FNRI) was published in the Malaysian Journal of Nutrition Vol. 24 No. 4, 2018: 475-492 (<http://nutriweb.org.my/mjn/publication/24-4/24-4.pdf>)

FORUMS AND CONFERENCES

ASTHRDP conducts 8th Graduate Scholars' Conference

In the increasing pace of technological change and globalization, the Accelerated Science and Technology Human Resource Development Program-National Science Consortium (ASTHRDP-NSC) conducted the Graduate Scholars' Conference Year 8 with a theme "Level Up to Level All: Science as Platform for Industry 4.0".

The scientific conference enabled the 442 MS and PhD scholar-graduates and faculty members from the consortium universities in the basic and applied sciences to interact with their co-scholars and mentors through oral and poster presentation.

The two-day conference provided the participants access to current developments in science and technology from local and international experts, such as the use of enabling technology, in particular, information and communications technology or the internet-of-things (IoT). The annual ASTHRDP graduate scholars conference aims to encourage scholars to conduct research studies that respond to the needs of the society, sustainability and national development.

(top - bottom) A participant of the poster exhibit competition presents her research to one of the judges; Dr. Rafaelita Aldaba, Undersecretary for Competitiveness and Innovation of the Department of Trade and Industry, Keynote Speaker to the conference gave a presentation of the readiness of Philippine Industries for Industry 4.0, what are the gaps in the innovation and entrepreneurship ecosystems and what needs to be done to bridge the gaps



The scientific conference enabled the 442 MS and PhD scholar-graduates and faculty members from the consortium universities in the basic and applied sciences to interact with their co-scholars and mentors through oral and poster presentation.



Dr. Joseph Frohlich of Austria Institute of Technology, one of the plenary speakers talks about the 4.0 Policy Strategies and the Role of the Universities

Education for Industry 4.0 highlighted in 5th National Research Conference

The 5th National Research Conference in Science and Mathematics Education was held at the Oriental Hotel, Legazpi City on February 28 – March 1, 2019 with the theme "STEM Towards Education 4.0". It espoused a commitment to level up STEM education – instruction and curriculum in order to meet the challenges and needs of Industry 4.0.



(top to bottom)

Dr. Noor Amila Wan Abdullah Zawawi, Director, Institute of Self-Sustainable Building, Universiti Teknologi Petronas, Malaysia gives a talk on Self-Sustainable Building

Cutting of Ribbon and Opening of Poster Exhibit by DOST ASec. Leah Buendia, DOST-SEI Deputy Director Engr. Albert Mariño, DTI USec. Rafaelita Aldaba, and ASTHRDP-NSC Chair Dr. Fabian Dayrit, together with the ASTHRDP-NSC Project Leaders

The 10 PhD ASTHRDP scholars and finalist to the Fast-Talk competition together with the ASTHRDP-NSC Chair Dr. Fabian Dayrit, DOST-SEI Director Dr. Josette Biyo, and DOST-SEI Deputy Director Engr. Albert Mariño



The researches presented in oral or poster forms were categorized under five (5) subject areas as follows:

1. Teaching Modes and Strategies
2. Teaching Capacity Development
3. Instructional Materials Development
4. Learning Experiences and Assessment
5. Conceptual Studies

The Conference brings together all scholars from consortium member-universities across the country, with an ever increasing annual turnout. The Keynote Speakers included: 1)

- Mr. Johnson Ong Chee Bin an AUN-QA Expert and a member of the AUN-QA Technical Team
- Dr. Imelda S. Caleon, a Senior Research Scientist and Programme Director of the Lifelong Learning, Cognition and Well-being Research Programme at the Centre for Research in Pedagogy and Practice, National Institute of Education
- Dr. Ian June L. Garces, Associate Professor at ADMU.

The three speakers described the global connectedness of Industry 4.0 and Education 4.0, highlighting the intermingling of STEM subjects in

the 4th Industrial Revolution. A total of 49 oral sessions and 29 poster presentations were presented.

ERDT presents roster of annual programs

The Engineering Research and Development for Technology (ERDT) organizes annual events and activities that include Congresses, Conferences, Faculty Trainings, Workshops, and Visiting Professors Lectures. These are designed to provide opportunities for ERDT scholars to learn from and/or collaborate with people from academe, industry, and government agencies.

TABLE 7: ERDT EVENTS AND ACTIVITIES IN 2019				
Title of Event/Activity	Theme/Focus	Date	Venue	Resource Persons
Engineering Forum Series	Connected People using Connected Gadgets – Internet of Things	11 January 2019	University of the Philippines Diliman	Dr. Romel Gomez
	Data Science	24 May 2019	University of the Philippines Diliman	Dr. Marsal Gavalda
ERDT Thesis/ Dissertation Writing Seminar	---	03 June 2019	Century Park Hotel	Dr. Maria Cecilia G. Conaco
				Dr. Delia B. Senoro
				Dr. Fernando D. Paragas
				Dr. Feorillo Petronilo A. Demeterio III
				Engr. Evan Dennison S. Livelo
				Sr. Isabel M. Austria
				Ms. Maria Rosita A. Mesa
8th ERDT Congress	The Rise of Smart Cities and Communities	23 August 2019	Philippine International Convention Center	Usec. Eliseo M. Rio, Jr.
				Dr. Hussein S. Lidasan
				Atty. Joanna Eileen M. Capones
				Ar. Felino A. Palafox
				Mr. Bernard Faustino M. Dy
				Engr. Edgar V. Sabidong
				Dr. Loinda R. Baldrias
16th ERDT Conference	Engineering for One Health	25 October 2019	Heritage Hotel	Dr. Michael L. Tee
				Dr. Lilia M. Fernando
				Dr. Nen-Fu Huang
				Dr. Lourdes Marie S. Tejero
Training on Effective Business Writing	---	05-06 December 2019	National Center for Transportation Studies	Ms. Ma. Teresa L. Pacis

TABLE 8: ERDT ROADSHOWS IN 2019			
Visiting Consortium Member	Date(s)	Host University	Province (Region)
UP Diliman	06 March 2019	Biliran Province State University	Biliran (VIII)
UP Diliman	22 March 2019	University of Eastern Philippines	Samar (VIII)
Mapua University	04-06 April 2019	Isabela State University	Isabela (II)
UP Diliman	16 May 2019	Iloilo Science and Technology University	Iloilo (VI)
UP Diliman	17 May 2019	University of the Philippines Visayas	Iloilo (VI)
UP Diliman	20 May 2019	Central Philippine University	Iloilo (VI)
Mapua University	27-29 May 2019	Batanes State College	Batanes (II)
Mapua University	27-29 June 2019	University of Mindanao	Davao del Sur (XI)
De La Salle University	02-03 December 2019	University of the Cordilleras	Baguio (CAR)

Tables 7 and 8 show the list of ERDT events and activities, and the roadshows that were undertaken in 2019.


2019 Engineering Forum Series

The first leg of the 2019 Engineering Forum Series was held on January 11, 2019 at UP Diliman. Visiting Professor, Dr. Romel Gomez expounded on the topic “Connected People using Connected Gadgets – Internet of Things”.

Dr. Gomez is a Professor and Associate Chair for Undergraduate Education in the Department of Electrical and Computer Engineering at the University of Maryland, College Park. His lecture was attended by graduate students and professionals from Ateneo de Manila University; De La Salle University; DOST Advanced Science and Technology Institute; DOST Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development; Mapua University; Mariano Marcos State University; UP College of Engineering; and UP College of Science.

The second leg, held on May 24, 2019 also at UP Diliman, was a lecture on data science conducted by Dr. Marsal Gavalda. The lecture revolved around the topics (1) Building a Data Culture/Data Mindset and (2) How to build conversational AI bots and how it is currently being applied in tech companies in the United States.

Dr. Gavalda is a senior R&D executive with deep expertise in natural language and machine learning



2nd Engineering Forum Series 2019

A Lecture on Data Science with Dr. Marsal Gavalda

24 May 2019 at 10 AM - 12 NN
Maynilad Room, 3F Melchor Hall,
UP Diliman, Quezon City



TOPICS TO BE COVERED

- Building a Data Culture/Data Mindset
- How to build conversational AI bots and how it is currently being applied in tech companies in the US

Preregistration is required for this free lecture. Seating is limited and on a first come, first served basis.
Preregister online at bit.ly/2M2BZtz

ABOUT THE SPEAKER

Marsal Gavalda is a senior R&D executive with deep expertise in natural language and machine learning technologies. Marsal is currently the head of Machine Learning at Square, where he applies automation and machine learning to advance Square's overarching purpose of economic empowerment. Previously, Marsal served as the Director of Research at MindMeld (acquired by Cisco), where he developed MindMeld's conversational AI and anticipatory computing platform. Marsal has also extensive experience in customer interaction and speech analytic space, as he has served as VP and Chief of Research at Verint Systems and as VP of Research and Incubation at Nexidia (acquired by NICE), where he developed disruptive speech analytics solutions for the call center, intelligence, and media markets.

Marsal holds a Ph.D. in Language Technologies and an MS in Computational Linguistics, both from Carnegie Mellon University, and a BS in Computer Science from BarcelonaTech. Marsal is the author of over thirty technical and literary publications, thirteen issued patents, and is fluent in six languages. He is also a frequent speaker at academic and industry conferences and organizes, every summer, a science and humanities summit in his hometown of Barcelona on topics as diverse as machine translation, music, or the neuroscience of free will.

technologies. He is currently the head of Machine Learning at Square, where he applies automation and machine learning to advance the companies overarching purpose of economic empowerment.

ERDT Thesis/Dissertation Writing Seminar

To complement the 2018 Faculty Research Mentoring Workshop, ERDT conducted a Thesis/Dissertation Writing Seminar which was principally designed for MS and PhD students who have just started or about to begin writing their research papers.

Attended by scholars from the eight ERDT Consortium member universities, the Seminar was held on June 3, 2019 at Century Park Hotel in Manila. In her opening speech, Dr. Rizalinda De Leon delved on one of the pressing problems in the country's R&D culture, which is the underutilization of different technologies being produced because there is no market for them. She encouraged the participants to consider looking for possible niches or to internalize who they are developing

the technology for before embarking on the actual process of coming up with one.

Covering the topic, *"Planning and Structuring the Thesis/Dissertation"*, Dr. Cecilia Coonaco presented an overview of the research cycle and gave tips on how to accomplish the different parts of a thesis or dissertation paper.

Following her talk was a discussion on the topic *"Writing the Literature Review and Effective Referencing"* led by Dr. Delia Senoro, who offered an ideal model to address the R&D dilemma previously mentioned by Dr. De Leon. Dr. Senoro asked the participants to try to identify what societal problems they want to address and use them to direct their research.

The last speaker for the morning session, Dr. Fernando Paragas, started his talk on *"Organizing Chapters and Ensuring Thought Cohesion"*, by presenting the misconceptions index. It showed that despite being the third least accurate country, the Philippines also ranked third in being the most

confident in its answer. Relating this to the topic, he asked the participants to conceptualize what they ought to transcend in each chapter in order to keep the presentation of ideas concise and organized.

For the afternoon session, Dr. Feorillo Demeterio presented a comparative analysis between models of research universities in the Philippines and abroad. He identified the challenges in the mentoring framework in the country and provided points on how the participants can work around this model in order to receive proper guidance and feedback from their research advisers. To cap the technical discussions, Dr. Isabel Austria and Mr. Evan Livelo, ERDT early graduate scholars, shared their experiences and some key points on how they were able to accomplish their research works in their session entitled *"Strategies for Effective Thesis/Dissertation Writing"*.

A short session on mindfulness followed to help ERDT scholars cope with the stress that comes with the process of thesis/dissertation writing. Finally, Engr. Albert Mariño reminded the participants that research should be purposeful and translatable. He

emphasized how the participants, as the country's future RSEs, should be able to empathize and identify with the ordinary Filipino in order to find the greater purpose embedded in their tracks.

8th ERDT Congress

With the theme, *"The Rise of Smart Cities and Communities"*, ERDT hosted its 8th Congress last August 23, 2019 at the Reception Hall of the Philippine International Convention Center. It was attended by scholars and faculty members from across the eight ERDT consortium member universities as well as delegates from other government agencies and select private institutions.

Department of Information and Communications Technology Undersecretary Eliso M. Rio, Jr. delivered the keynote speech about the direction and efforts of DICT towards enhancing and strengthening the country's infostructure in convergence to Industry 4.0.

First plenary speaker Dr. Hussein S. Lidasan, Dean of UP School of Urban and Regional Planning, posited that ICT should be incorporated in urban planning for smart city concepts. He was followed by Atty. Joanna Eileen Capones, Vice President for Investment Promotions and Marketing of the Bases Conversion and Development Authority, who gave



Plenary speakers receive Certificate of Appreciation from the ERDT

an overview presentation on the New Clark City which is dubbed to be the "city of the future".

The afternoon plenary session begun with the presentation of Architect Felino "Jun" Palafox, Managing Partner and Principal Architect of Palafox Associates. Ar. Palafox focused on how the application of smart mobility concepts and climate resiliency features in urban landscape can effectively address the effects and rising demands of urban development and climate change.

To provide a closer look at how excellence in the delivery of social services can be achieved through information and communications technology, Mayor Bernard Faustino M. Dy of Cauayan, Isabela talked about their Smarter City Projects designed to support and promote smarter MSMEs, health care, agriculture, climate change adaptation, transportation, solid waste management, jobs, and government.

Resource speakers answering questions from the audience during the Open Forum



TABLE 9: BEST POSTER AWARDEES IN THE 8TH ERDT CONGRESS

R&D Track	Title of Poster	Presenting Author	Co-Authors	Institution
Energy	Combined Mixture Designed Experiments and Bioreactors Studies on the Ethanol Fermentation Behavior of Two Evolutionary Engineered <i>Saccharomyces cerevisiae</i> Strains in Glucose-Xylose Mixtures	John Nikko Salvilla	Fidel rey P. Nayve, Catalino G. Alfara	UP Los Baños
Environment and Infrastructure	Seismic Risk of Metro Manila DPWH Bridges	Eden S. Ditchella	Andres Winston C. Oreta	De La Salle University
Information and Communications Technology	Low-Cost Lora-Based Transmission System for Weather Balloon	May Anne C. Valencia		Mapua University
Manufacturing and Machinery	Microwave Drying of Stingless Bee Pollens	Franz Z. Miranda	Carolyn Grace G. Somera	Central Luzon State University
Semiconductor Materials and Electronics	Optimization of Decellularization Parameters in Developing Renal Extracellular matrix Scaffolds from Porcine Kidney	Tosha Mae Manalastas	Nathaniel P. Dugos, Gliceria B. Ramos	De La Salle University

The last plenary speaker, Engr. Edgar V. Sabidong, Chair of the Philippine Green Building Council, talked about Sustainable Developments Leading to Smart Cities and Communities.

The recipients of the best poster awards are (see Table 9):

16th ERDT Conference

The 16th Engineering Research and Development for Technology Conference was held on October 25, 2019 at Heritage Hotel in Pasay City. Close to 300 participants from the eight ERDT consortium member universities

Prof. Ferdinand G. Manegdeg welcoming the participants to the Conference



attended the event and were welcomed by the new Program Leader of ERDT, Prof. Ferdinand G. Manegdeg.

With the theme “Engineering for One Health”, the Conference’s plenary session was anchored mainly on engineering innovations and solutions directed towards the advancement of the quality of health of humans, animals, and the environment.

Dr. Loinda R. Baldrias began the morning plenary by providing an overview on one health, highlighting the relevance of biomedical engineering as a multidisciplinary STEM field that combines biological knowledge and engineering principles to address medical needs.

In his plenary talk entitled “Innovations in Early Detection and Interventions for One Health”, Dr. Michael L. Tee, emphasized the need to propose engineering solutions with a one health perspective to deal with the root cause of agricultural-borne diseases and zoonotic diseases such as the African Swine Flu in the Philippines.

Dr. Lilia M. Fernando then talked about “Nanobiosensors for the Detection of Pathogens”, stressing the need for

the development of new rapid and sensitive detection and identification technologies for microbial agents, and shared projects that revolve around the use of nanobiosensors on different applications.

Guest speaker Dr. Nen-Fu Huang from Taiwan’s National Tsinghua University, expounded on the topic “Complete Food Traceability for One Health with AIoT Technologies”, advocating for the integration of IoT, robotics, and automation to increase crop quantity and quality, which will further translate to better food security, and increase in farmers’ revenue.

Dr. Lourdes Marie S. Tejero capped the session with the topic, “Business Opportunities and Collaborations in Engineering for One Health”. She explained that engineering solutions are at the peak of addressing pain points in health care, and gave tips on how biodesign teams can pitch their ideas and technologies to the healthcare market.

See Table 10 for the paper awardees during the conference.

The participants posing for a group photo at the end of the Conference



TABLE 10: BEST PAPER AWARDEES IN THE 16TH ERDT CONFERENCE				
R&D Track	Title of Poster	Presenting Author	Co-Authors	Institution
Energy	An Assessment on the Nationwide Solid Waste-to-Energy Potential Model Development in the Philippines	Ronald Allan Co	Enrico Paringit	UP Diliman
Environment and Infrastructure	Laboratory Pullout Test of Geogrid Reinforcements for Submerged Mechanically Stabilized Earth for Waterfront Applications	Allan E. Botuyan		Mindanao State University – Iligan Institute of Technology
	Solution Blow Spinning (SBS) PAN-assisted Cellulose Nanofiber Membrane	Glebert C. Dadol	Kramer Joseph A. Lim, Luis K. Cabatingan Noel Peter B. Tan	University of San Carlos
Information and Communications Technology	Comparison of High-Level Musical Feature Sets and Distance Metrics in the Recommendation of Classical Music	Ana Felicia T. Cruz	Andrei D. Coronel	Ateneo de Manila University
Manufacturing and Machinery	Design, Fabrication and Performance Evaluation of Cashew Apple (Anacardium occidentale L.) Slicing Machine	Kay J. Jaranilla	Helen F. Gavino, Romeo B. Gavino Carolyn Grace G. Somera	Central Luzon State University
Semiconductor Materials and Electronics	Detection of Chlorpyrifos-methyl Pesticide Residue in Rough, Brown and Milled Rice using an LED-based NIR Instrument	Fatima S. Rodriguez	Paul R. Armstrong Elizabeth B. Maghirang Erin D. Scully Frank H. Arthur Daniel L. Brabec	UP Los Baños

"ENGINEERING FOR ONE HEALTH", the Conference's plenary session was anchored mainly on engineering innovations and solutions directed towards the advancement of the quality of health of humans, animals, and the environment.

Graduates attest to the value of ERDT Scholarship Program



“The journey I had in the most prestigious institution of the country, the University of the Philippines Los Baños, was really a great opportunity. Yes, all the people in the academe were so influential in making my PhD journey a success. Aside from the knowledge imparted on me by my brilliant professors, UPLB thought me how to be creative, patient, persistent, diligent, flexible, and strong to face the challenges of university life. It had also provided me with an excellent foundation to build a rewarding career and a happy life. Lastly, I am indeed so blessed to be given the opportunity to be one of the only few ERDT scholars because without this scholarship, I may not be able to push through with this study. I will always be thankful for everything that I gained during my PhD journey at UPLB.”

REYNOLD M. CAOILI
PhD in Agricultural Engineering
UP Los Baños



“My study in Japan was made possible through the Engineering Research and Development for Technology (ERDT) Faculty Development Program Foreign Scholarship. I would like to thank Dr. Arnold Elepaño and the ERDT staff for assisting me for three years. I was able to join conferences where I met researchers all over the world. I gained skills particularly in field works, laboratory analysis and journal paper writing throughout the course of three years. I was also lucky since my professor, Dr. Katsuhide Yokoyama, instilled in me excellence and perseverance. There were many challenges so I believe one must be mentally, emotionally, financially and physically strong in taking a PhD degree. I wish to impart to my students the knowledge that I gained and create future collaborative projects with other researchers.”

JOAN CECILIA C. CASILA
PhD in Engineering major in
Civil and Environmental Engineering
Tokyo Metropolitan University

“Engineering Research and Development for Technology gave me another chance in life. The scholarship served as the catalyst of self-discovery that harnessed my full potential as an agricultural engineer. Not only did I gain essential knowledge but I also gained a family, with other ERDT scholars, along the way. The whole journey of completing my master’s degree led to my passion of serving the nation—serving the Filipino people.”

ROMEL A. ARROBANG
MS Agricultural Engineering
UP Los Baños



“I am Joemer A. Adorna Jr, an MS in Chemical Engineering student at the University of the Philippines Los Baños (UPLB). For my thesis, I have taken the opportunity to do my experiments in the Biomedical Engineering and Environmental Sciences Department (BMES) at National Tsing Hua University (NTHU), Taiwan. I am very grateful for the DOST - ERDT sandwich program for supporting the completion of my study. My sincere gratitude goes to them, for the opportunity and experience of letting me do my graduate studies in NTHU, Taiwan.”

JOEMER A. ADORNA
MS Chemical Engineering
UP Los Baños



“My study in Japan was made possible through the Engineering Research and Development for Technology (ERDT) Faculty Development Program Foreign Scholarship. I would like to thank Dr. Arnold Elepaño and the ERDT staff for assisting me for three years. I was able to join conferences where I met researchers all over the world. I gained skills particularly in field works, laboratory analysis and journal paper writing throughout the course of three years. I was also lucky since my professor, Dr. Katsuhide Yokoyama, instilled in me excellence and perseverance. There were many challenges so I believe one must be mentally, emotionally, financially and physically strong in taking a PhD degree. I wish to impart to my students the knowledge that I gained and create future collaborative projects with other researchers.”

JOAN CECILIA C. CASILA
PhD in Engineering major in
Civil and Environmental Engineering
Tokyo Metropolitan University

Graduates attest to the value of ERDT Scholarship Program



“In 2017, I wanted to get promoted soon in any government agency. For me to be promoted, I should have a master’s degree. I know that taking up a master’s degree in IE, specifically the Production Systems track, will help me properly solve the problems in the service/production industry. I applied for ERDT scholarship. It gave me a higher stipend than my net pay, and gave me more time with my family while taking up masters. It also enabled me to finish my master’s degree in 2 years. Now, there are a lot of opportunities for research dissemination and promotion. I am also teaching the next generation how to apply IE in the different industries, and especially in their lives.”

REGINE A. TEJADA
MS Industrial Engineering
UP Diliman



“ERDT scholarship is an amazing program especially for young Filipino engineers like me who are interested in pursuing graduate studies. With the great help of this scholarship, I was able finish my MS thesis in less than a year, and my degree in three semesters. This scholarship also gave me the opportunity to present my research work in an international conference in Sweden.”

JOHN NIKKO V. SALVILLA
MS Energy Engineering
UP Diliman

“The completion, successful defense and presentation of my dissertation entitled ‘Iodine-129 as an Environmental Tracer for Groundwater and Hydrological Processes’, an assessment of groundwater vulnerability to salinity contamination using a radioisotope of iodine, Iodine-129, was through the help of the Engineering Research and Development for Technology (ERDT) of the Department of Science and Technology (DOST). The program funded my Sandwich Program in MALT, University of Tokyo that helped me gain access to conduct experiments using the Accelerator Mass Spectrometry (AMS), Inductively Coupled Plasma Mass Spectrometry (ICP-MS) and Ion Chromatography (IC).”

SUNSHINE PETAL V. TAN
PhD in Environmental Engineering
(Sandwich Program)
UP Diliman



“Through the ERDT scholarship program, I finished my master’s degree in Energy Engineering in one of the country’s top schools. In my whole two years of graduate studies, DOST-ERDT provided everything I needed that all I have to do was show up and deliver. The work I also poured over my thesis eventually paid for itself after making most of the scholarship’s thesis grant, research grant, and dissemination grant. I am so grateful for all the privileges I enjoyed, one is being paid to learn. Truly, there’s no scholarship as good as ERDT.”

JESSA A. IBANEZ
MS Energy Engineering
UP Diliman



DOST-SEI extends CLM Scholarship Program

The scholarship program offered by the DOST through DOST-SEI to qualified citizens of Cambodia, Lao PDR, and Myanmar (CLM) has been extended with the pledge of additional 24 scholarship slots from 2019 to 2021.

An offshoot of the 9th Informal ASEAN Ministerial Meeting on Science and Technology (IAMMST-9) held on October 29, 2016 in Siem Reap, Cambodia, the CLM Scholarship program aims to promote human resource development in engineering and sciences for sustainable socio-economic development of the ASEAN region, particularly in these three countries. The DOST-SEI went to CLM to select scholars of the program, which began in the Second Semester of AY 2017-2018.

DOST Secretary Fortunato de la Peña pledged additional support during the 10th Informal ASEAN Ministerial Meeting on Science and Technology (IAMMST-10) on October 19, 2018 in Cebu City. Hence, the second batch of scholars was interviewed on May 13-17, 2019 in Lao PDR and Myanmar. The scholarship took effect starting AY 2019-2020.

In addition to the current number of scholars, i.e. 14 MS and four Ph.D, the second batch has seven MS and one Ph.D scholars who are enrolled in DLSU-Manila, UP-Diliman, UPLB and UP-Manila. Of these, 11 are from Cambodia, three from Lao PDR and 12 from Myanmar. The scholars were all of good academic standing as of the end of the First Semester. Ten of them are already working on their thesis/dissertation proposals. Out of this number, one scholar in MS ECE at DLSU is expected to graduate in February 2020.

Table 11 shows the lists of the two batches of CLM scholars.

TABLE 11: ON-GOING CLM SCHOLARS IN 2019		
NAME	COURSE	EFFECTIVITY OF SCHOLARSHIP
DE LA SALLE UNIVERSITY (DLSU)		
Batch 1		
Ms. Khin Than Thin	Ph.D Civil Engineering	Term 1 AY 2018-2019
Mr. Meta Mouy	MS Mechanical Engineering	Term 3 AY 2018-2019
Ms. Socheata Yem	MS Chemical Engineering	Term 3 AY 2018-2019
Mr. Sovannmony Lay	MS Chemical Engineering	Term 1 AY 2018-2019
Ms. Sychheng Meas	MS Chemical Engineering	Term 3 AY 2018-2019
Mr. Tun Tun Oo	MS Electronics and Communications Engineering	Term 3 AY 2017-2018
Batch 2		
Khamsoy Siphengpheth	MS Mechanical Engineering	Term 1 AY 2019-2020
Xiong Lue	MS Mechanical Engineering	Term 1 AY 2019-2020
UP-DILIMAN		
Batch 1		
Mr. Nourn Cheanhchiayseyha	MS Environmental Engineering	1st Semester AY 2019-2020
Mr. Samdy Hann	MS Environmental Engineering	1st Semester AY 2018-2019
Mr. Sophirak Nou	MS Energy Engineering	2nd Semester AY 2018-2019
UP-LOS BANOS		
Batch 1		
Mr. Ye Win Aung	Ph.D Genetics	1st Semester AY 2018-2019
Ms. Khin Hnin Yu	Ph.D Agronomy	1st Semester AY 2018-2019
Mr. Myo Thant Kyaw	MS Environmental Science	1st Semester AY 2018-2019
Mr. Phyo Wai Htike	Ph.D Entomology	1st Semester AY 2018-2019
Mr. Zayar Soe	MS Entomology	1st Semester AY 2018-2019
Batch 2		
Mr. Aung La Pyae	MS Natural Resources and Conservation	1st Semester AY 2019-2020
Ms. Thu Zar Kyaw	MS Plant Breeding	1t Semester AY 2019-2020
Mr. Ko Ko Maung	MS Agronomy	1st Semester AY 2019-2020
Ms. Kay Thi Khaing	Ph.D Agronomy	1st Semester AY 2019-2020
Mr. Sachai Saykhammoun	MS Agricultural Engineering	1st Semester AY 2019-2020
UP-MANILA		
Batch 1		
Mr. Dayuth An	MS Public Health (Nutrition)	2nd Semester AY 2017-2018
Ms. Nariroth Keo	MS Clinical Medicine (OB-GYN)	2nd Semester AY 2017-2018
Mr. Samoun Nam	MS Public Health (Environmental Health)	2nd Semester AY 2017-2018
Ms. Sovannpany Kim	MS Public Health (Nutrition)	1st Semester AY 2019-2020
Batch 2		
Mr. Mya Win Hnit	MS in Clinical Medicine (Family Medicine)	2nd Semester AY 2019-2020



DOST Scholarship Offerings for ASEAN Researchers at Cambodia - Lao PDR - Myanmar (CLM)

A Get-together of DOST, Partner-Universities and Scholars, was held on January 15, 2019 at the DOST-SEI. In his message, Secretary de la Peña said that this program bridges the gap between ASEAN member-states in terms of science, technology and innovation. The scholars expressed their appreciation for the opportunity extended to them by the Philippine government through DOST.

DOST-SEI awards another batch of scholars for Marawi

To continue with the capacity building of Marawi, DOST-SEI Director Josette T. Biyo proposed to extend the Bangon Marawi Scholarship Program which gained the approval of DOST Secretary de la Peña on September 5, 2019. The second batch included 177 BS, 27 MS and three Ph.D scholars who attended the orientation on scholarship policies and contract signing together with their parents or guardians on October 16, 2019 at the MSU-Main Campus, Marawi City.



Orientation on Scholarship Policies and Contract Signing on 16 October 2019 which was attended by scholars and their parents and guardians

Meanwhile, among the first batch of the Bangon Marawi program, 131 BS scholars already graduated from their respective degrees. Out of this number, three graduated Magna cum laude and nine graduated Cum laude, a positive sign of hope through education for the people after their struggles and hardships brought about by the siege.

The smooth and effective implementation of the program and the financial and technical assistance

provided to the scholars were delegated to the Project Director and Project Coordinator at MSU. Working Committees were also created to oversee the implementation, formulate policies and provide intervention programs for the scholars. The Working Committees held three meetings in 2019.

The Learning Resource Center (LRC) at the MSU-Main Campus opened on September 27, 2019 to facilitate research and other academic activities of scholars

without requiring them to draw from the financial assistance they receive from DOST-SEI. The Institute conducted a Focus Group Discussion (FGD) with some of the scholars, all of whom expressed their gratitude for the educational opportunities given to them.

ACCESSIBILITY SOLUTIONS

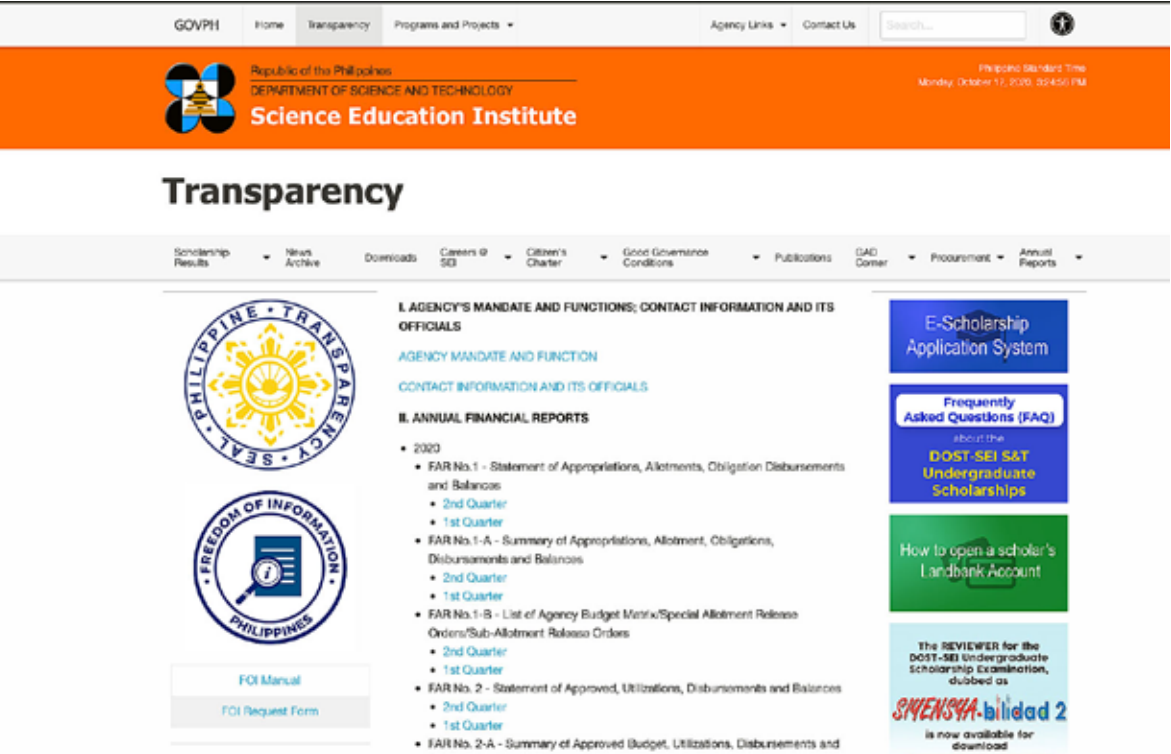
MIS Unit enhances SEI's connectivity with stakeholders

DOST-SEI's Management Information System Unit (MISU) continues to enhance the Institute's capabilities to connect with the public and provide access to basic services. Its e-Scholarship Online Application System that was launched in 2018 reached 107,918 applicants in 2019. The system enables thousands of DOST-SEI Undergraduate Scholarship applicants nationwide to conveniently secure appointment slots and upload copies of their scholarship application documents and other requirements via www.sei.dost.gov.ph. Kiosks were also made available at the DOST-SEI for walk-in applicants.



Students using the e-Scholarship Application System

(topmost) Student applying for DOST-SEI S&T Scholarship uses kiosk at the DOST-SEI lobby



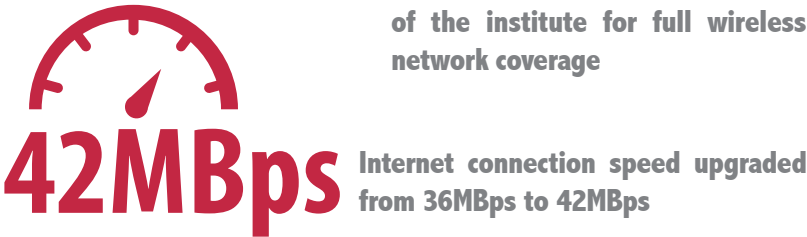
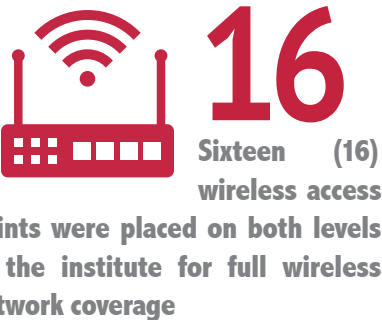
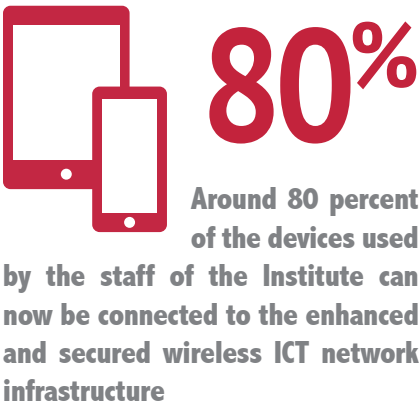
The MISU also enhanced the Undergraduate Scholarship Application System used for issuance of Test Permit of the scholarship applicants. The system is accessible in the DOST Regional Offices and Provincial Science and Technology Centers to monitor the distribution of applicants among different test centers across the country. The system is also linked to the DOST-SEI kiosk which was primarily used during the scholarship application period to gather data from applicants and speed up the issuance of test permits.

The Institute continuously maintains and updates its website to provide current, relevant, and accurate information on its programs and services while ensuring compliance with the Department of Budget and Management's Transparency Seal requirements. The Intranet also benefited from the upgrades and resulted in improved internal information dissemination.

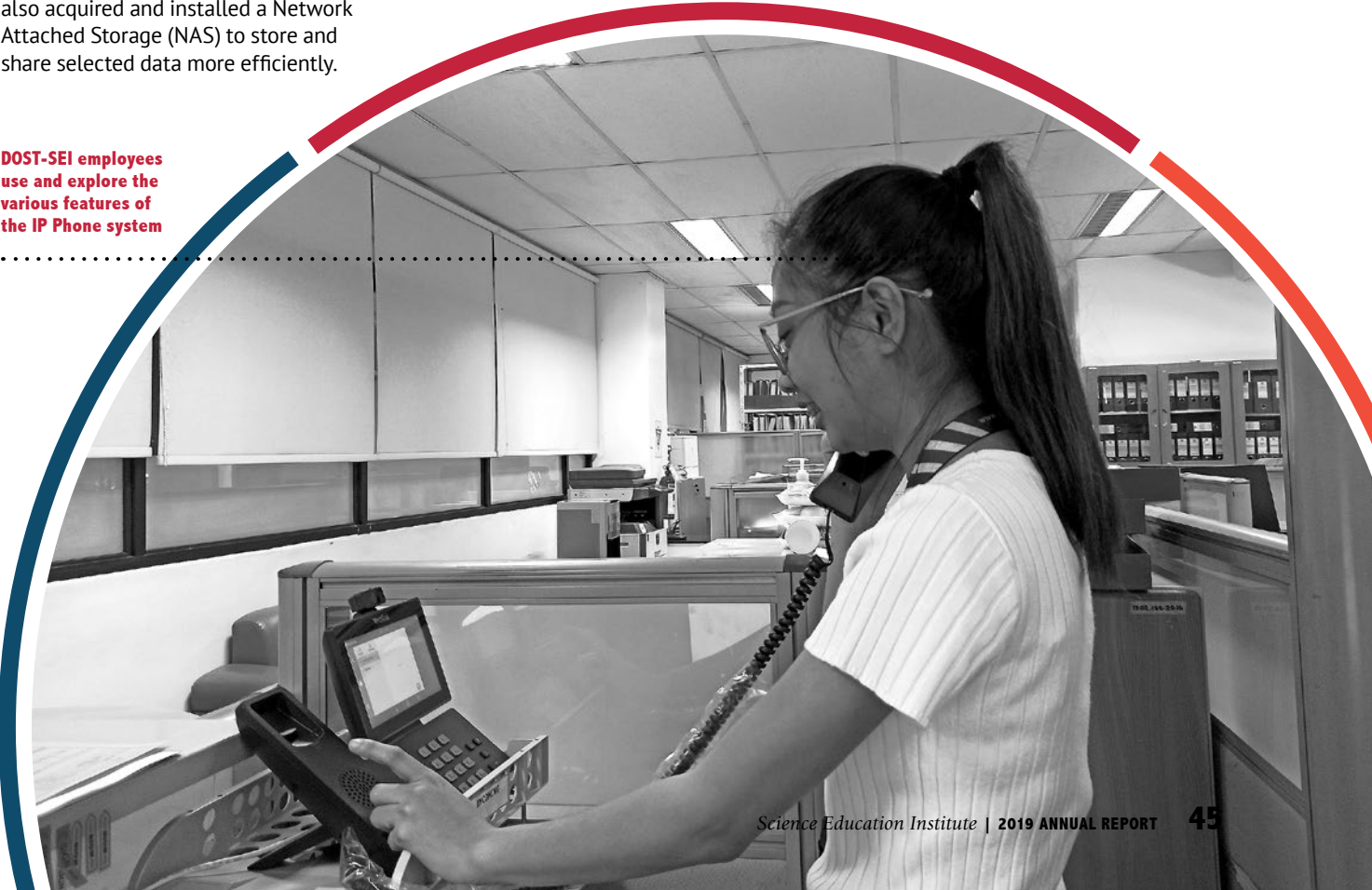
The yearly increase in the number of scholars supported leads to an increase in the number of hard copies of scholars' documents. The Institute's solution to the ever-rising challenge of managing, archiving, and retrieving documents, which now total more than 53,000, is the Digitization Project. DOST-SEI also acquired and installed a Network Attached Storage (NAS) to store and share selected data more efficiently.

Enhanced Secured Wireless Network

Around 80 percent of the devices used by the staff of the Institute can now be connected to the enhanced and secured wireless ICT network infrastructure. Sixteen (16) wireless access points were placed on both levels of the Institute for full wireless network coverage, with internet connection speed upgraded from 36Mbps to 42Mbps. Eight (8) wireless access points were also placed to provide internet access for the guests and visitors. Endpoint security solutions were also installed on employees' workstations to ensure secure transfer of data and provide protection from malware and viruses. Preventive maintenance of every device connected to the local area network is annually conducted to ensure that they are working effectively and efficiently to power the services provided by the institute.



DOST-SEI employees use and explore the various features of the IP Phone system



DOST-SEI employees use and explore the various features of the IP Phone system

Upgrading Communication System

In order to improve the Communication System, the MISU set up an automatic telephone switching system. Part of the initial initiatives was the installation of 11 units of IP Phones capable of video calls, conference calls, and handling GSM Mobile calls. An additional 30 units will be set up throughout the Institute and 15 units will be distributed to DOST Regional offices to ease the communication between Scholarship Programs Administrators and Coordinators. The whole system is planned to connect with the existing analog telephone lines to handle calls from clients and stakeholders.

Creating a Secure and Resilient Data Center

The MISU Server Room is now equipped with the Facial Recognition Door Access System to further secure and log access to the Institutes' future data center facility. In addition, IP Cameras will also be installed. Four (4) server



MISU Personnel using the Facial Recognition Door Access System



racks are currently maintained inside the facility which houses the network storage devices for the Data and Archival System, public servers for the Institutes' website and other online application systems, private servers for the local information systems to power the internal administration processes, and network security devices for the protection of the ICT infrastructure from internal and external threats, and for the conduct of vulnerability and penetration tests. The facility is continuously upgraded for the programs and projects that need ICT network services to reach more clients across

the country and is also planned to work with the upcoming data center colocation facility for resiliency and disaster recovery plans of the Institute.

Enhancing Human Resources Competencies with ICT Awareness and Literacy

The MISU regularly conducts ICT Workshops and Orientations to familiarize the workforce on the use of ICT technologies and their policies and security protocols. For this year, four workshops and orientations were conducted. (See Table 12)

MISU employee conducts an Orientation and Training on the various features of the Information System Strategic Plan and Introduction to the Data Privacy Act



Table 12: ICT-Related Training and Workshops Conducted for DOST-SEI Network Users

Title of Training-Workshop	Date Conducted	No. of Participants		Total
		Female	Male	
Orientation of Employees on the Use of the IP Phone System	15 February 2019	16	5	21
Orientation and Training on the various features of the Information System Strategic Plan and Introduction to the Data Privacy Act	25-26 March 2019	21	11	32
Orientation on Network Attached Storage	13 November 2019	6	10	16
Reorientation on ICT Policy and Computer Security Essentials	26-27 November 2019	50	25	75



INNOVATIVE DEVELOPMENTS IN STEM EDUCATION

SECTION

2

One of the key factors that enhances a country's economic value is its capacity to take full advantage of global digital breakthroughs and translate these into tactical roadmaps that drive all sectors forward, enhance industrial potentials, and revolutionize academic ecosystems. This is the essence of **SGD target 8.2** that aims to achieve higher levels of economic productivity through diversification, technological upgrading and innovation.

We are witnesses to how digital technology has been transforming the structure of curricula, teaching, learning and school environments for decades. We continue to glimpse where this development is taking us—towards a future of limitless lifelong learning.

As government agencies and the education sector embrace the strong impacts of innovation with e-learning and open distance learning, this section captures how the Institute addresses the needs of both STEM educators and learners. It creates and promotes student-centered physical and virtual learning environments that enable relevant Science, Technology, Engineering, and Mathematics (STEM) education through scientific research undertakings, growth-oriented academe-industry linkages, and a progressive technological infrastructure.

SECTION 2 SDG CATEGORY AND ACTIVITIES

FILIPINO PATRIOT SCHOLARS PROJECT

MOBILE STEM LEARNING SOLUTIONS

21ST CENTURY LEARNING ENVIRONMENT MODEL

INNOBOX

STORYBOOKS FOR YOUNG CHILDREN IN SCIENCE AND MATHEMATICS

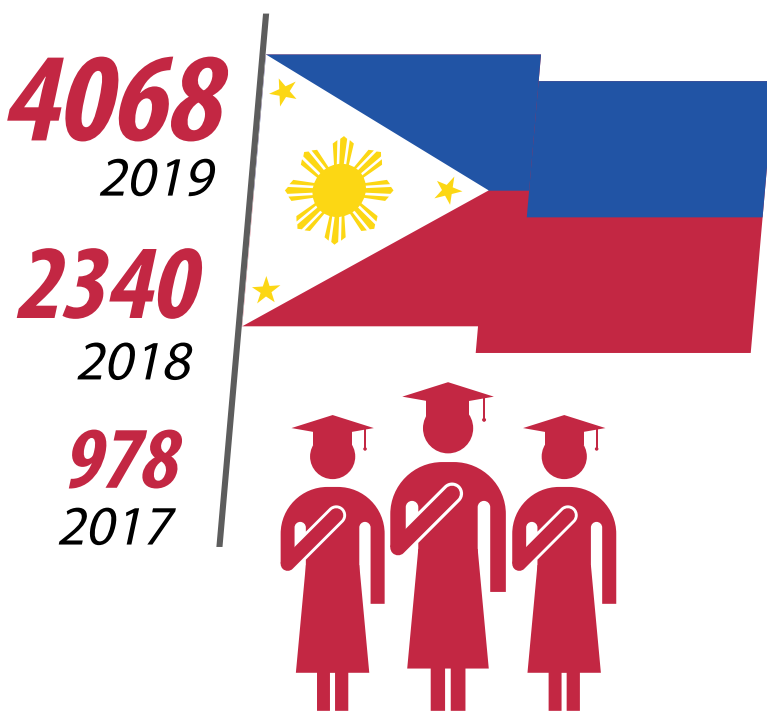


FIGURE 5:
NUMBER OF SCHOLARS SERVED IN 2019 BY THE
FILIPINO PATRIOT SCHOLARS PROJECT

More DOST-SEI scholars
take part in volunteerism
towards nation-building

In its third year of implementation, the Filipino Patriot Scholars Project, which aims to foster patriotism among DOST-SEI Scholars and encourage their engagement in national service, expanded the reach of its various activities. The project significantly increased the number of scholars reached by 57 percent over the previous year, covering a total of 4,068 DOST-SEI scholars. (see Figure 5)

Among those reached by the Project, 3,357 scholars from Regions I, III, IV-A, IV-B, V, VI, VII, VIII, X, XI, XII, CARAGA and CAR participated in the 2-Day Scholars' Formation Program (Phase 1). The 374 DOST-SEI scholars from Regions I and VIII were capacitated through the Comprehensive Community-Based Disaster Risk Reduction and Management (CBDRRM) Training of the Patriot Project Phase 2.

Furthermore, 133 DOST-SEI Patriot Scholars from Region I responded to the call of doing volunteering initiatives funded by the Institute. Their activities included the conduct of Seminar-Workshops on Mental Awareness and Eco-bricking, Model Urban Garden, Equipping Pupils Toward Building a Stronger Foundation, Securing a Better Future of Ballaigi ti UNP (BUDS) and Scholars' Nutrition Assistance Program (SNAP). (see Figure 6)

Over-all Rating of 2-Day Scholars' Formation Program



Over-all Rating of the Community-based Disaster Risk Reduction
Management (CDRRM) Training



Over-all Rating of the Orientation-Workshop on Innovating SME for Civic Impact
for CBPSME MS and PhD Scholars

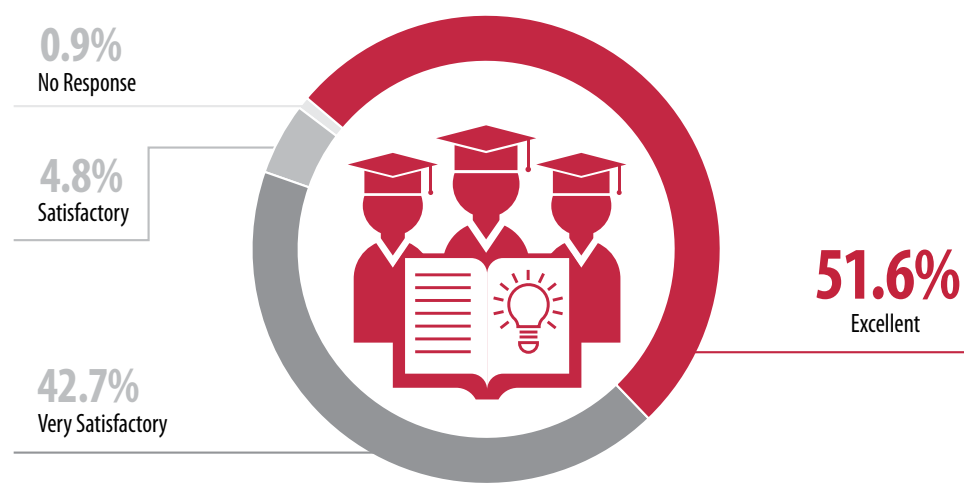


FIGURE 6:
PARTICIPANTS' OVER-ALL RATING OF THE ACTIVITIES OF THE PATRIOT PROJECT

Another accomplishment was the pilot conduct of “Orientation-Workshop on Innovating SME for Civic Impact for CBPSME MS and PhD Scholars”. A total of 337 MS and PhD scholars under the Capacity Building Program in Science and Mathematics (CBPSME) participated in the orientation-workshop. A planning-workshop was conducted on June 15, 2019 in Hotel Jen, Pasay City to develop new schemes and modules for the formation program

catering to innovative science and mathematics teachers.

The participants in general gave positive ratings on the three major activities of the Patriot Scholars Project in 2019, demonstrating its critical role in imbuing its beneficiaries with a sense of patriotism and volunteerism as they develop and apply their full potential to the scientific communities, to the nation, and to the rest of the world.

Conduct of 2-Day Scholars' Formation Program



Significant Insights

Learned from the activities of The Filipino Patriot Project

“Live not only for your own satisfaction, your countrymen need you more than anything else. We, as scholars, can make a difference: take actions and be the voice of those less fortunate. Take your part in making our country better.”

– ACTUAL FEEDBACK FROM THE PARTICIPANTS –

“This is a life-changing event for me. I honestly want to work in the Philippines. It just strengthened the determination to serve my fellow countrymen in the near future.”

– ACTUAL FEEDBACK FROM THE PARTICIPANTS –

“Being a patriot is not simply by helping but a sacrifice to serve your country because of your love.”

– ACTUAL FEEDBACK FROM THE PARTICIPANTS –

“Ang pagiging iskolar ng bayan ay di natatapos sa 4 o 5 taon sa akademiya. Tayo ay patuloy na magiging iskolar ng bayan.”

– ACTUAL FEEDBACK FROM THE PARTICIPANTS –

Mobile STEM learning solutions reach more schools

DOST Courseware and Mobile Applications package

In 2019, more schools took advantage of the free DOST Courseware and Mobile Applications (DOST-CMAPP) package distributed through public exhibitions and education conferences. Produced by DOST-SEI, the collection features courseware in science and mathematics that can be downloaded and accessed through Android and IOS smartphones and tablets. These modules can be integrated in blended teaching and learning and make educational environments more productive and engaging to the learners in a variety of interactive ways. More modules were also added for Grade 3-6 Science in Google Play store as IOS versions gain presence online for the Apple users.

To reach out to more beneficiaries and familiarize teachers and learners on the DOST Courseware and related technologies, several events were held to demonstrate their features. Free copies of the software were also distributed for classroom use. *(see Table 13)*

Table 13: DOST Courseware Promotional Activities and Event Participation

Event	Organizer	Venue/Date
Edutech Philippines 2018: “21st Century Quality Education for All in the Philippines”	Department of Education (DepEd)	SMX, Pasay City February 21, 2019
Education Transformation Summit 2.0: “Re-engineering Basic Education Towards Community Transformation and Nation Building”	Department of Education (DepEd) Schools Division of Ilocos Norte	Plaza de Norte, Laoag City, Ilocos Norte, May 20-21 2019
National Science and Technology Week (NSTW) - Manila	Department of Science and Technology (DOST) - Central	World Trade Center, Pasay City July 17-21, 2019
Science Teacher Academy for the Regions (STAR) First International Conference - “Perspectives in Science and Mathematics Education: Building Connections, Sustaining Innovations and Sharing Pedagogies”	DOST - Science Education Institute (SEI)	Philippine International Convention Center (PICC) 8 August 2019
Regional Science and Technology Week (NSTW) – DOST Region 6	Department of Science and Technology (DOST) – Region 6	Iloilo Convention Center, Iloilo City October 21-25, 2019
21st Century Leadership Skill Enhancement Program	Department of Education (DepEd) Schools Division of Bataan	Olongapo City December 16, 2019



Teachers from Division of Ilocos Norte (left) and Bataan (right) delightfully receive their free copies of the DOST Courseware in Science and Mathematics



Ms. Josephine Feliciano of DOST-SEI presents the DOST Courseware and Related Technologies produced by DOST-SEI during the Edutech Philippines in SMX, Pasay City (left); participants of the STAR International conference try the DOST Courseware (right)

Twelve (12) more modules for Grades 3 to 6 Science were added to the roster of DOST Courseware Mobile Applications for Android, comprising a total of 112 applications available for free download in Google Play. The new modules consist of:

- GRADE 3
1. Special Properties of Solid
 2. The Eye
 3. Propagating Plants
- GRADE 4
1. Reproduction in Plants
 2. The Animal Story
 3. Day and Night
- GRADE 5
1. Chemical Change
 2. Menstruation/Menstrual Cycle
 3. Electromagnets
- GRADE 6
1. Circulatory System
 2. Earthquake
 3. Nuclear Energy

For 2019, there were 14,119 installs from Google play monitored, making a total of 50,697 downloads for the 112 modules since they were uploaded in 2016. In the App Store for Apple, which carries 20 modules, there were 625 installs in 2019 and a total of 741 since they came online in November 2018. *(see Tables 14 & 15)*



(clockwise) A parent assists her child in navigating the Courseware Mathematics module; while a learner downloads the module from Google Play; and shows the installed module during the RSTW in Iloilo City

The whole package of DOST Courseware for MS Windows can also be downloaded from the DOST-SEI website at <http://www.sei.dost.gov.ph/index.php/programs-and-projects/innovations/83-courseware>. The download page has registered 28,529 hits since its activation in 2019.

DOST S&T Examination Reviewer Mobile Application –Siyensya-bilidad

The DOST Undergraduate Scholarship Examination Reviewer Mobile Application – *Siyensya-bilidad* is a mobile application that provides a different approach from the normal lecture and module based review, focusing instead on developing one's skills in taking tests by simulating DOST S&T Exam questions and providing detailed and well-structured solutions to each question. It is designed to test the grasp of basic knowledge and level of retention of subjects and topics from the K-12 curriculum, and gives the student-reviewer the idea of mastery of each subject.

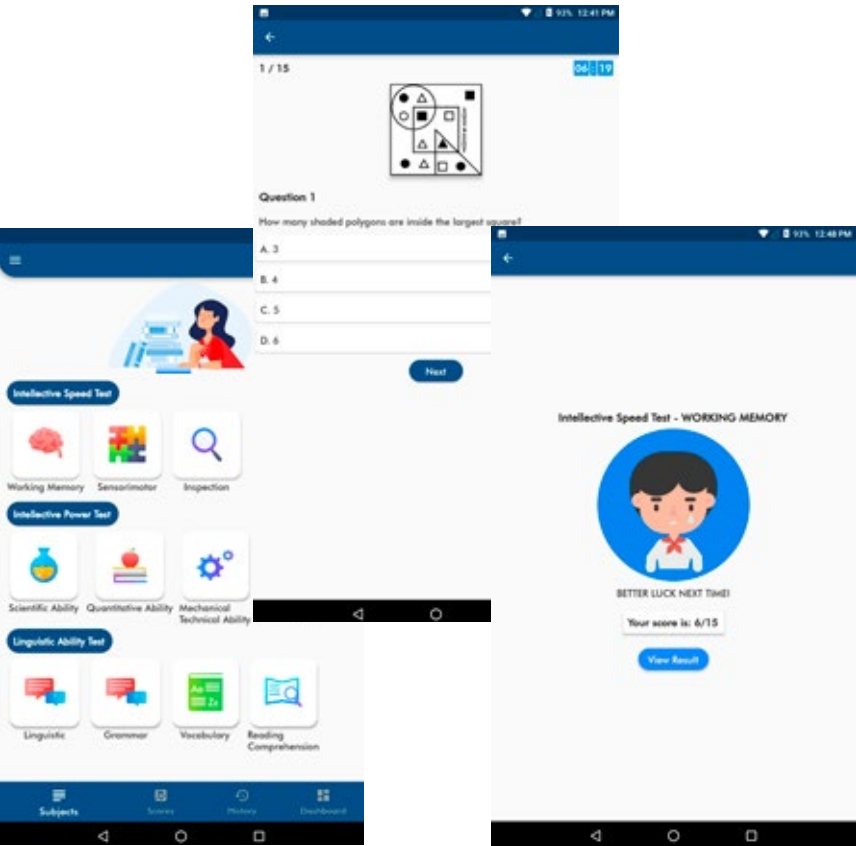
A total of 393 test items answerable in 332 minutes are loaded into the mobile application, which has a scalable interface to accommodate more test items in the future. The test items were drawn from the first two volumes of *Siyensya-bilidad* reviewer, and can be unlimitedly accessed and operated offline once installed in Android-based smartphones and tablets. The app's features include (a) user profiling of basic information; (b) timer for each item; (c) scoring system; and (d) answer key with rationalization.

The mobile reviewer primarily aims to benefit students in identified municipalities without qualifiers in the DOST S&T Undergraduate Examinations.

(right) Screenshots of the beta version of the DOST S&T Examinations Mobile Application Reviewer Interface – *Siyensya-bilidad*

Table 14: Number of Installs by Grade Level & Subject from Google Play Store		
Grade/Subject	No. of Installs 2019	No. of Installs (Total since 2016)
Grade 7 - Science	1,700	5,762
Grade 7 – Mathematics	1,781	5,940
Grade 8 - Science	1,391	7,140
Grade 8 – Mathematics	1,951	6,967
Grade 1-6 Mathematics	6,149	23,741
Grades 3-6 Science	1,147	1,147
Total	14,119	50,697

Table 15: Number of Installs by Grade Level & Subject from Apple Store		
Grade/Subject	No. of Installs 2019	No. of Installs (Lifetime since November 2018)
Grade 7 - Science	137	158
Grade 7 – Mathematics	72	90
Grade 8 - Science	271	320
Grade 8 – Mathematics	145	173
Total	625	741



Strategic Intervention Material For Teaching With Augmented Reality (SIMaTAR)

As with the two initial pilot test schools Surigao City NHS and A.Villegas VMHS, another research was conducted on SIMaTAR to provide information on the effectiveness of the material in teaching Science. A teacher from Inosloban-Marawoy Integrated NHS in Lipa City, Batangas, Mr. Jay-Ar Z. Gutierrez, came up with a research on “*Creative Teaching in Grade 10 Science using DOST-SEI Strategic Intervention Material for Teaching with Augmented Reality (SIMaTAR)*”.

Research findings implied a significant difference before and after the use of SIMaTAR among students as shown in pre-and post-test results, indicating that SIMaTAR effectively assisted the teacher-researcher in providing manipulative application that enhances the 21st century skills of the learner. Majority of the students agreed that SIMaTAR impacted their learning positively.

(left, top to bottom) Students of Inosloban-Marawoy INHS try the SIMaTAR module on Earthquake; while teacher-researcher Jay-R Z. Gutierrez observes his students getting engaged in the augmented reality feature of SIMaTAR

(below) The five Strategic Intervention Materials for Teaching with Augmented Reality (SIMaTAR) print modules



More schools adopt SEI'S 21ST Century Learning Environment Model (21ST CLEM)

Under the Institute's project Access to Resources and Innovations in Science Education (ARISE), the 21st Century Learning Environment Model (CLEM) adopted by pilot public high schools in Lipa City, Batangas gained momentum in 2019. Eighteen (18) more schools from the DepEd divisions of Ilocos Norte; Cauayan City in Isabela; Angeles City, Pampanga; Calamba City, Los Baños, and San Pablo in Laguna; Lopez, Quezon; and Masbate City adopted the model.

Burgos Agro-Industrial School (BAIS) in Burgos, Ilocos Norte's 21st CLEM (left) and their Open Learning Space (OLS) (right) inaugurated on May 27, 2019



Burgos Central Elementary School (BCES) in Burgos, Ilocos Norte's 21st CLEM (left) and Open Learning Space (OLS) (right) inaugurated on May 2019

The 21st CLEM provides an ecosystem of learning environments, education, information and communications technology resources and innovations, and serves as a support system to the Science, Technology, Engineering, and Mathematics (STEM) education as covered in the K to 12 Curriculum. The model adheres to the sustainable development goal of ensuring inclusive and equitable quality education and promotes lifelong learning opportunities for all. It is designed to be child, disability and gender sensitive, with access to internet and computers for pedagogical purposes.

Inauguration by the school-adoptors

Two schools in Northern Luzon province of Ilocos Norte – Burgos Agro-Industrial School (BAIS) and Burgos Central Elementary School

(BCES) inaugurated their 21st CLEM Classrooms in May 27, 2019 to revolutionize the educational landscape in the province through the special education funding assistance from the Local Government Unit (LGU) led by Mayor Rodolfo Garcia together with DepEd Division of Ilocos Norte SDS Vilma D. Eda. The two 21st CLEMs also feature the Open Learning Space (OLS), an area where students can conduct their research, reading and other socio-academic activities.

Six months after the inauguration of their two 21st CLEMs, the Municipal Government of Burgos, Ilocos Norte entered for the first time in the Digital Governance Awards and won Second Place National Level under the Best in eGOV Customer Empowerment Category (G2C) conferred by the Department of the

Mayor Rodolfo Garcia (fourth from left) of Burgos, Ilocos Norte unveils the 21st CLEM marker of the two recipient-schools BAIS and BCES. He was joined by DepEd Region 1 Director Malcolm Garma, DepEd Ilocos Norte SDS Vilma Eda and staff and Josephine S. Feliciano, project leader of 21st CLEM for SEI-DOST



Interior and Local Government (DILG), Department of Information and Communication Technology (DICT), and National ICT Confederation of the Philippines (NCIP) in November 2019. Prior to the awarding, Burgos, Ilocos Norte presented the "21st Century Learning Environment Model (CLEM) Classrooms" and impressed the judges during the Final Judging last October 16-18, 2019 at Bayview Park Hotel, Manila.

In Southern Tagalog, Laguna schools San Pablo City NHS soft-launched their model in July in partnership with stakeholders for the technologies, while Los Baños Senior HS 21st CLEM was inaugurated by the DOST Secretary Fortunato T. De la Peña and DOST Region 4A – CALABARZON Director Alexander R. Madrigal during the DOST 4A-CALABARZON Regional Science and Technology Week (RSTW) celebration on September 25, 2019.

Mayor Garcia tries the Virtual Reality (VR) technology being one of the features in 21st CLEM as explained by Ms. Feliciano of DOST-SEI during the inauguration of 21st CLEM in BAIS



(Left photo) Secretary Fortunato T. Dela Peña joined by DOST Region 4A Calabarzon Director Alexander Madrigal (7th from left) Mayor Caesar Perez of Los Baños, (5th from left) officials from DepEd Division of Los Baños, Laguna and teaching staff during the inauguration of the Los Baños Senior High School's 21st CLEM held in celebration of the DOST 4A Regional Science and Technology Week (RSTW) on September 25, 2019

(Right photo) Sec. Fortunato T. Dela Peña listens as a student from LBSHS demonstrates the functions of the visualizer, one of the instructional technologies in their 21st CLEM



Ms. Josephine Feliciano of DOST-SEI joins SDS Ludy Pasagui of DepEd Division of San Pablo City, Laguna, PTA President, representatives from LGU, faculty and students of San Pablo City NHS during the soft launch of their 21st CLEM

The other school-adopters were set to launch their own 21st CLEMs in 2020. The list of current model pilot schools and adopters is presented in Table 16.

Table 16: Model Pilot School Adoptors			
Region	School Name	Deped Division/District	Type Of School
4A	Bolbok INHS	Lipa City, Batangas, (Pilot)	Regular HS
4A	Inosloban-Marawoy INHS	Lipa City, Batangas, (Pilot)	Regular HS
4A	Lipa City Science NHS	Lipa City, Batangas, (Pilot)	Science NHS
4A	Pinagtongulan INHS	Lipa City, Batangas, (Pilot)	Regular HS
4A	San Celestino INHS	Lipa City, Batangas, (Pilot)	Regular HS
1	Burgos Central ES	Ilocos Norte/Burgos District	Regular ES
1	Burgos Agro-Industrial HS	Ilocos Norte/Burgos District	Regular HS
4A	San Pablo City NHS	San Pablo City, Laguna	Regular HS
4A	Los Baños Senior HS	Los Baños, Laguna	Senior HS
4A	Lopez CNHS	Lopez, Quezon	Regular HS
4A	Bambang NHS	Los Baños, Laguna	Regular HS
2	Cauayan NHS	Cauayan City, Isabela	Regular HS
4A	Calamba Science HS	Calamba City, Laguna	Science NHS
4A	Calamba Bayside HS	Calamba City, Laguna	Regular HS
4A	Jose Rizal Memorial School	Calamba City, Laguna	Regular HS
4A	Kapayapan Senior HS	Calamba City, Laguna	Senior HS
4A	Calamba CES	Calamba City, Laguna	Regular ES
1	Pagudpud ES	Ilocos Norte/ Pagudpud	Regular ES
1	Bacarra ES	Ilocos Norte/Bacarra	Regular ES
1	Bangui ES	Ilocos Norte/ Bacarra	Regular ES
5	Panique HS	Masbate City	Regular HS
3	Angeles ES	Angeles City	Regular ES
3	Clemente N. Dayrit ES	Angeles City	Regular ES

Study on 21st CLEM effectiveness in pilot schools

A mixed method research was conducted to measure 21st century teaching and learning. Research tools or questionnaires used to guide this study focused on the instructional activities and perceptions that will examine the relationship between strategy, student achievement, development of 21st century skills, and the physical learning environment and certain attitudes with attribution to several researches conducted on these topics. The following are the tools used:

- A Survey for Measuring 21st Century Teaching – Teachers
 - A Survey for Measuring 21st Century Teaching – Students
- With attribution and permission to use from Hixson, N.K., Ravitz, J., Whisman, A. (2012). Extended professional development in project-based learning: Impacts on 21st century teaching and student achievement. Charleston, WV: West Virginia Department of Education, Division of Teaching and Learning, Office of Research, USA



Grade 10 students from pilot school Bolbok INHS (left) and Lipa City Science NHS (right) participate in the survey during the conduct of exploratory research on 21st CLEM



- Effect of 21st CLEM to learning and attitude of students for Focus Group Discussion (FGD), with attribution to “An analysis of the effect of a 21st-century-designed middle school on student achievement”, Gary David Schwartz University of Northern Iowa, USA
- A Survey for Measuring Acceptability of and Attitude Towards Learning in 21st Century Learning Environment Model (21st CLEM)
- Classroom Management Observation Guide

Impacts on 21st Century Teaching

Research findings showed that 21st CLEM contributed to the teaching and learning of 21st century skill outcomes. Technologies assisted both teachers and learners in achieving teaching and learning objectives within the time frame, bringing greater details and more dimension to the lessons using a blended teaching and learning approach. Teaching in 21st CLEM has the greater amount of instruction of the eight 21st century skills than the traditional classroom.

Impacts on 21st Century Learning

Results show that for the 21st CLEM students, Using Technology as a Tool for Learning, Collaboration

and Communication was the skill they most learned while Global Connections was the least. The physical design challenged students to become more competitive, productive and participative. Technology changed the learning style of students as it greatly assisted in research and presentation of outputs.

Though the teachers believed that Collaboration was the most learned skill, both teachers and students agreed on the least taught/learned skills, which were Global Connections, Local Connections and Self-Direction.

Impacts on Student Achievement.

A significant gain increment of the mean percentage scores were seen in the experimental sections in the 21st CLEM from third to fourth grading period based on the students’ pre-test and post-test for Science, Mathematics and English.

Acceptability of and attitude of students towards learning in 21st CLEM. The results of the survey administered to 157 student-respondents showed that the 21st CLEM and its features are conducive, comfortable, neat, clean, safe and secure for students, contributing to enhanced levels of motivation and engagement. Physically, mentally and socially, the 21st CLEM enhanced students’ ability to interact or socialize, minimized stress and exhaustion, and enabled them to discover new things.



The research result on the effectiveness of the exploratory study was subsequently presented to Sen. Raphael Recto during a public forum in August 2019 (left) and to the officials of DepEd Division of Lipa City five pilot school heads and 21st CLEM managers (right) in October 2019 in Lipa City

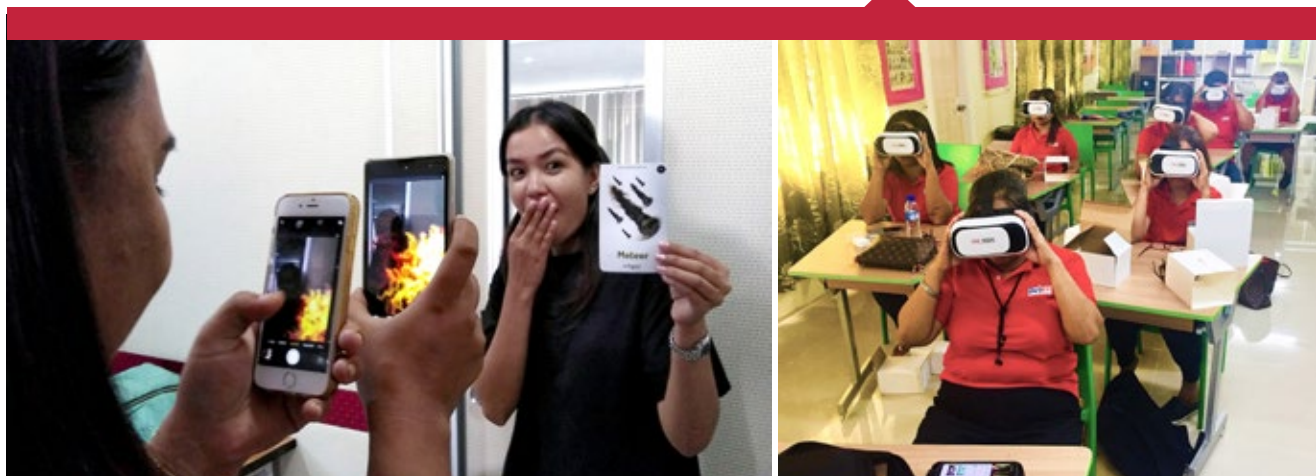
21ST CLEM adoptors seminar-workshop

As part of the standard requirement for adopting the 21st CLEM, teachers and students from school-adoptors attended the prescribed seminar-workshops by DOST-SEI on integration of 21st century teaching and learning practices, including sustainability of the learning environment, application of appropriate education, information, instructional and creative technologies including robotics and 3D printing. (see Table 17)

Table 17: CLEM Workshops Conducted in 2019		
Title	School Participants	Date And Venue
21st CLEM Sustainability and Maintenance	Los Banos Senior HS, Bambang Senior HS (Laguna) and Lopez CNHS (Quezon)	May 9, 2019 DOST 4A, Los Banos, Laguna
21st CLEM Sustainability and Maintenance	Burgos Agro-Industrial School and Burgos Central Elementary School -Burgos, Ilocos Norte	May 23, 2019 Burgos, Ilocos Norte
Virtual and Augmented Reality for Teaching and Learning	Burgos Agro-Industrial School Burgos Central Elem. School	November 7, 2019 The Grand Hotel, Laoag City, Ilocos Norte
Integration of 21st Century Teaching Practices in the Classroom	Pagudpud, Paoay, Bangui, San Nicolas and Pasuquin Districts of Ilocos Norte	
Mapping and Integration of DOST Courseware in Science and Mathematics		

(left) A teacher from the Los Baños Senior HS, Laguna amazed herself with the Augmented Reality application Space 4D during the seminar-workshop in May 2019

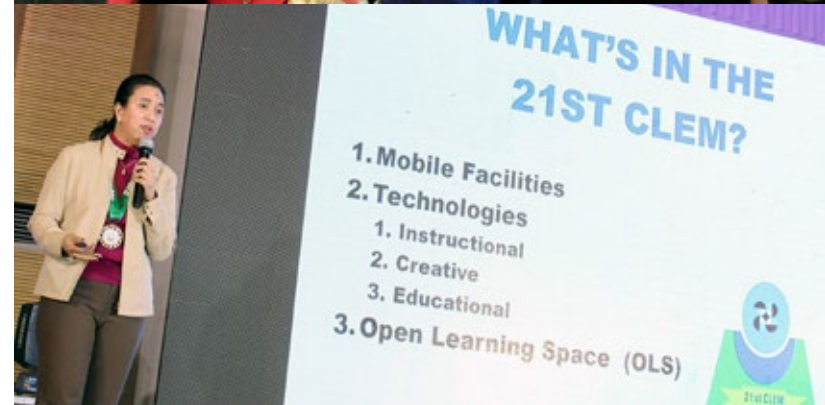
(right) Teachers from Burgos Central Elementary School, Ilocos Norte try the Virtual Reality technology during the seminar-workshop for education technologies in May 2019



Learners try the Augmented Reality-enabled cards on animals during the 21st CLEM exhibition at the DOST 6 RSTW in Iloilo City



21st CLEM project leader Ms. Josephine S. Feliciano doing a presentation in front of representatives of various division offices from the Department of Education (DepEd) and stakeholders during these events: (top) DOST-PCIEERRD's Tech Talk in Dusit Thani Manila Hotel; (bottom) DOST-PSTC Dumaguete City's Slingshot Dumaguete 2019 in Brooke's Place



21st CLEM Public Presentation and Exhibition

In 2019, DOST-SEI through project ARISE participated in several events that reached out to more beneficiaries and familiarized teachers, learners and stakeholders to the 21st Century Learning Environment (21st CLEM) as well as the DOST Courseware in Science and Mathematics and emerging trends in education technologies such as Virtual and Augmented Reality.

21st Century Model Classroom facility and benchmarking guests

A total of 472 students, teachers, education superintendents and supervisors, government organizations, local government units (LGUs), and private institutions visited and benchmarked the 21st Century Model Classroom (21stCMC) of DOST-SEI and attended the briefing on 21st century learning environment and emerging education technologies. (see Table 18)

Table 18: 2019 Benchmarking Guests			
Region	Male	Female	No. of Visitors
3	38	18	56
4A	6	16	22
5	2	3	5
7	1	1	2
12	16	8	24
NCR	250	81	331
CAR	0	1	1
CARAGA	1	2	3
International	14	14	28
Total	328	144	472



Ateneo de Manila Senior HS students immerse themselves using the virtual technology application Underwater demonstrated by Virtual Class during their visit at DOST-SEI's 21st Century Classroom



Graduate students from the University of Rizal System, Morong, Rizal excitedly try the Augmented Reality cards Animal 4D+ by Octagon

InnoBox receives more entries on its second run

Now on its second run, InnoBox continues to challenge science and math teachers to come up with innovative ideas for more engaging learning experience in the classroom.

Compared to 2018's 72 proposals, 2019 garnered nearly double at 140 proposals. Fifteen (15) of these advanced to the project pitching stage, out of which nine (9) teaching and learning resources were selected to compete for the finals. The final three will be awarded as the most innovative in April 2020.

InnoBox is a nationwide search for the most innovative teaching and learning resources. The competition is open to all public and private elementary and secondary school teachers who are teaching science and/or mathematics in the following categories: Grades 3-6; Grades 7-10; and Grades 11-12. It aims to encourage teachers to be innovative, creative, and practical in teaching science and math concepts to improve students' performance in the subjects.

In 2019 the school finalists were: Agusan del Sur Pilot Laboratory School, Jose Zurbito Sr. Elementary School and Pio Valenzuela Elementary School for Grades 3-6 Category; Cavite National Science High School, Napsan National High School and Tanza National Trade School for Grades 7-10 Category; and Ligao National High School, Quezon City Science High School and Talisayan National High School for Grades 11-12 Category.



The InnoBox finalists of the Grades 3-6 Category pitch their innovative TLRs to the technical committee



The InnoBox finalists of the Grades 7-10 Category pitch their innovative TLRs to the technical committee





The InnoBox finalists of the Grades 11-12 Category pitch their innovative TLRs to the technical committee

DOST-SEI Encourages Teachers to Use Storybooks to Boost the Interests of Young Children in Science and Mathematics

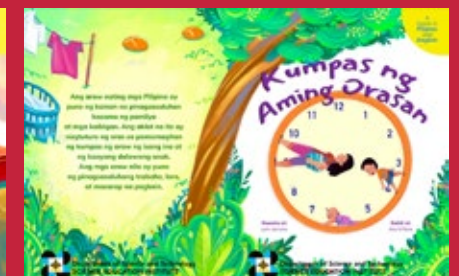
To encourage teachers to use storybooks to enhance the development of their pupils and at the same time boost their interests in science and mathematics, the DOST-SEI initiated the development of storybooks designed for children who are 6-8 years old. For 2019, a total of ten (10) storybooks were produced.

The storybooks were written by child development experts from the UP College of Home Economics and illustrated by freelance artists. The books contain stories written in Filipino and in English, guidelines for story tellers, and brief descriptions of writers and artists. The following are the titles of storybooks developed: *Ang Mabagal na Higad*; *Ang Munting Luntian*; *May Bago Akong Kaibigan*; *Super Meal*; *Kumpas ng Aming Orasan*; *Lakbay Nanay*; *Mga Regalo ni Tatay*; *Nag-iisang Buwan*; *Humigit Kumulang*; and *Sakay Na, Bubwit*.

The move to develop storybooks in science and mathematics was initiated based on various studies that shows the importance of storybook reading for the development of early language and literacy of the young children. Storybook reading enhances the children's learning by encouraging the development of several skills that are important to the child's development. Research also shows that children who learn to read early are those who have been read to.

The development of storybooks was also conceptualized in support of Sustainable Development Goal 4 to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. It is hoped that with the use of storybooks, the gap of more than fifty percent (50%) of an estimated 617 million children and adolescents of primary and lower secondary school age worldwide who were not achieving minimum proficiency levels in reading and mathematics, will be reduced.

Storybooks in Science and Mathematics for children with ages ranging from 6 to 8 years old





INCLUSIVE LEARNING ENVIRONMENTS

SECTION

3

In today's world, inclusivity is no longer just an ethical duty, but rather the very impetus for sustainable economic progress, thus the need for equity-centered action plans that cut across industries and improve overall societal development. As the nation strives to move toward a higher growth trajectory, the educational sector is consequently ramping up efforts to implement multi-faceted paradigms and deliver quality education to all Filipinos.

To this end, the Institute helps in enabling STEM teachers across the country to level the playing field in academic institutions and further tap into underserved groups. It leverages innovation and technology to initiate formal and non-formal capacity-building programs for individuals and groups, including those with disabilities and those from the indigenous sector, providing them with pertinent, impactful learning experiences while taking into consideration their diversified cultural backgrounds, needs, perspectives, and aptitudes. This sets the stage for a well-versed, more dynamic nation—one that has a competent human capital and institutional capacity to thrive in the face of global disruption.

SECTION 3 SDG CATEGORY AND ACTIVITIES

	4 QUALITY EDUCATION	5 GENDER EQUALITY	8 DECENT WORK AND ECONOMIC GROWTH	10 REDUCED INEQUALITIES	17 PARTNERSHIPS FOR THE GOALS
CONTENT/PEDAGOGY TRAININGS AND MODULE DEVELOPMENT	👍		👍	👍	
DOST-SETUP FOR SENIOR S&M TEACHERS	👍		👍	👍	
SCIENCE EXPLORER	👍	👍		👍	
SUPPORT FOR INDIGENOUS PEOPLE'S EDUCATION	👍		👍	👍	
ASSISTIVE MATERIALS FOR VISUALLY IMPAIRED LEARNERS	👍			👍	
MENTORING PROGRAM TO IMPROVE SCHOLARSHIP AVAILMENT	👍		👍	👍	
PROJECT STAR TRAININGS	👍		👍	👍	👍
CBHRS MANUAL DEVELOPMENT			👍	👍	
TRAINING ON DRRM	👍			👍	👍
PARTNERSHIP WITH FOREIGN NETWORK INSTITUTIONS	👍			👍	👍
GENDER AND DEVELOPMENT INITIATIVES		👍	👍	👍	
ENDORSEMENT OF S&T ELIGIBILITY SPECIALISTS			👍	👍	

Modules and pedagogy training boost skills of non-physics major science teachers

Recognizing the challenges of teachers who are non-Physics majors to deliver the contents of the subject effectively and efficiently, especially in schools without laboratories and other resources to aid in their lectures and reporting activities, DOST-SEI commissioned subject experts to develop Physics modules for Grade 8.

Covering Force, Motion and Energy strand of the K-12 Curriculum, these modules provide information about the topics and are accompanied by activities to engage the learners. Activities were designed to utilize easy-to-find materials, be relevant to learners' lives, and promote higher-order thinking skills.



Authors present the Teaching Modules for Grade 8: Force, Motion, and Energy

Table 19: Teaching Modules Developed For Teachers Who Are Non-Physics Major

Modules	Authors
Laws of Motion	Mr. Ramon L. Sanchez III
Work and Energy	Dr. Sheryl Lyn C. Monterola
Heat and Temperature	Mr. John-Niel T. Masong
Electricity	Mr. Michael Kennedy G. Camarao
Sounds	Ms. Ma. Angelie A. Millanes
Colors of Light	



Utilizing the developed modules, science teachers from Region I who are Physics non-major but teaching the subject in Grade 8 were invited to participate in a training intended to improve their content mastery and pedagogical skills. The training was conducted on July 31 to August 3, 2019 in Bauang, La Union, and participated in by 48 (17 male, 31 female) teachers representing all DepEd divisions of the region.

Participants highly commended the conduct of the training and expressed gratitude to DOST-SEI for complementing DepEd's goal to improve qualifications of teachers, which will result to improved performance of students.

Participants receive copy of the Teaching Modules as additional reference in teaching Physics

Teachers perform workshops on (L-R, clockwise) wave motion, reflection of light waves using common materials, and net force





Teachers from small private schools receive training on Mathematics

The Institute continues to provide teachers from small private schools with equitable access to content and pedagogy training. In its second year of implementation, Region IV-A teachers of elementary mathematics underwent training on Numbers and Number Sense for Grades 5&6.

The training enhanced the content mastery of teachers on the topic and assisted them in developing manipulatives that promote critical thinking and problem-solving skills of students. Two batches of training were held: the first batch of teachers from Batangas and Quezon provinces were trained on October 28-30, 2019 in Lipa City, Batangas; and the second batch of teachers from Laguna and Cavite were trained on December 3-5, 2019 in Tagaytay City.

Dr. Ma. Nympha B. Joaquin of the UP College of Education served as the trainer/resource person for both batches.

Participants prepare and present manipulatives for elementary mathematics



Who says Workshops can't be fun? Participants enjoy the Workshop on symmetry and tower building



Personnel from the PDRMO (above) and PSWDO (topmost) discuss immediate response to common accidents and the rights and privileges of senior citizens, respectively

Seminar promotes DOST SET-UP for senior S&M teachers nearing retirement

Science and mathematics teachers nearing retirement (55 – 60 years old) were invited to a Seminar on "Empowering the Elderly through Science and Technology" to keep them abreast of scientific advances related to ageing, impart survival skills during disasters, and promote entrepreneurship via the Small Enterprises Upgrading Program (SET-UP) of DOST as an option for small scale business venture. A total of 74 teachers benefitted from the training held in Bataan and Zambales on October 14-15 and October 17-18, 2020, respectively.

In this continuing initiative of DOST-SEI, teacher-participants learned basic survival skills during calamities through discussion and demonstration by the Provincial Disaster Risk Reduction Management Office. Technical personnel from the Provincial Health Office discussed topics related to the health of older persons and the common diseases and accidents related to ageing, including their corresponding management. The seminar also presented the rights and privileges of senior citizens as facilitated by the Provincial Social Welfare and Development Office.

The activity also introduced SET-UP, to encourage the teachers to venture into business through a package of assistance that includes the provision of equipment and innovations. Representatives from Amanda's Marine Products, BEAKRIS House of Goodies in Bataan, Mercedita's Bakeshop, and W.W.W. Machine Works, all DOST SET-UP beneficiaries, shared their experiences on how the program enabled them to grow their business.



Ms. Armanda T. Battad, owner and DOST SET-UP beneficiary, shows and explains the different work stations to the teachers

nuLab: STEM in Motion offers a modern mobile learning environment that can help pique students' interest in the sciences. It boasts a huge interactive board at the center with individual monitors installed at each side of the bus that allows a flexible learning experience for students



Science Explorer expands its reach to Early and Intermediate Learners and Senior High School Students in the country

The Science Explorer, the country's first and only mobile learning science facility, continues to reach young learners in different provinces in the Philippines. In 2019, the project gave a "ride to the future" to a total of 4,314 students from 92 schools in Luzon and Visayas.

The project also launched its new bus unit dubbed as "nuLab: STEM in Motion" during the 2019 National Science and Technology Week on July 17, 2019 and sailed to Visayas Region to participate in the Regional S&T Week in Iloilo on October 21-24, 2019. The new bus caters to senior high students to allow them to discover their potential in various STEM fields and to encourage them to apply for DOST Scholarship Program.





DOST Secretary Fortunato T. De la Peña and DepEd Secretary Leonor Briones lead the ribbon cutting ceremony together with DOST-SEI Director Dr. Josette T. Biyo during the launch of its newest mobile science facility “nuLab: STEM in Motion” on the first day of the 2019 National Science and Technology Week celebration. Also in attendance are DOST Undersecretary for R&D Dr. Rowena Cristina Guevara and DOST Ambassador and former PBA star player Mr. Chris Tiu

REACHING OUT TO ALL LEARNERS. The Science Explorer and nuLab mobile facilities were able to serve students from the north in Sagada (CAR) down to the south in Manila, Pasig, Pasay (NCR), Laguna (Region IV-A), Capiz, Antique, Iloilo (Region VI) to inspire them to pursue STEM courses and careers in the future

The nuLab project developed 14 new modules by the country's top young scientists and DOST Scholar-Graduates for senior high school. Pilot-tested during its roadtrip in 2019 were the following:

1. Aerospace Engineering - Dr. Rogel Mari Sese, Astrophysicist
2. Earthquake "The Big One: Handa ka na Ba" - Chamaine Villamil PHIVOLCS
3. Dalubkulisapan - Dr. Aimee Dupo UPLB
4. Oceanography - Dr. Alette Yñiguez UPD
5. Nanotechnology - Engr. Myra Ruth Poblete (Ph.D. Candidate) - UP
6. MathSaya Magdrawing: Bezier Curves - Dr. Jomar F. Rabajante UPLB
7. Arduino Programming - Mr. Javier Javier, DOST-SEI
8. The History of Science - TJ Dimacali
9. Science Media Literacy - Shaira Panela
10. Science Filmmaking - Prof. Seymour Sanchez
11. Science Communication - Prof. Garry Montemayor, UPLB
12. Nuclear Science - Ms. Ana Jamille Restubog and PNRI
13. LEGO UV3 Robotics - Mr. Gilbert Zamora, Felta Multimedia Inc
14. Astronomy – Mr. Nico Mendoza, DOST- PAGASA



In support of gender equality and women empowerment, the project provides equal opportunities to male and female students and conducts STEM module sessions with all-girl participants to promote engineering courses.

Support for indigenous people's education continues

Grant of teaching aid to schools in indigenous communities

In appreciation of their support to the project, Teaching Science to Indigenous Pupils, which DOST-SEI has been conducting since 2015, the Institute donated human torso models to five schools within the Indigenous Cultural Communities (ICC) in Tarlac and Pampanga on February 21-22, 2019.

The recipient schools are Burog Elementary School, San Martin Elementary School, Villa Maria Integrated School, Camias Resettlement Elementary School, and Katutubo Village Elementary School.

The human torso models come with a primer to assist teachers in providing a realistic representation of the human body, and present lessons on different organ systems more clearly.



Ms. Joan Salise (Senior SRS, DOST-SEI) presents how to use the human torso model to Ms. Francisca Ventura (Principal) and teachers of Villa Maria Integrated School, in the presence of IP Focal Persons Mr. Arnold Montemayor (DepEd Region III) and Mr. Ruel Bondoc (Pampanga Division)

VALIDATION. Lessons are presented to the group composed of IP elders, DepEd personnel, and subject expert to validate if the IKSPs used are correct and appropriate to the topic



Post-Lesson Conference. Teachers, IP elders, focal persons, and resource person discuss on how to further improve the lessons based on the learners' response during the field testing



More science lessons indigenized for IP learners

Teachers of beneficiary schools in Tarlac and Pampanga produced additional 32 indigenized science lessons in Grades 3-6. These lessons underwent Validation and Field Testing in the presence of IP elders in their respective communities and IP Focal Persons from DepEd Region 3 to ensure that lessons are culture-based and within the context of the indigenous knowledge, skills, and practices (IKSP) of the community. Three participating schools in the DepEd Division in Pampanga produced 17 indigenized lessons, while two participating schools in the DepEd Division in Tarlac produced 15 indigenized lessons. The final lesson plans will be forwarded to DepEd Region 3 for Quality Assurance (QA) before teachers of the beneficiary schools can fully adopt them.

Field Testing. Teacher Ara invites Tatay Temy, an IP elder, to share indigenous knowledge related to the topic, Ecosystem, to Grade 6 learners



Mr. Arnold Montemayor, IP Focal Person of DepEd Region III, presents the initiatives of the Department on curriculum contextualization, indigenization in particular

Seminar on indigenization held for teachers

As a continuing professional development of teachers assigned in schools in indigenous communities, a seminar-workshop on “Indigenization in Science and Mathematics Education” was conducted on December 10-11, 2019 in Angeles City, Pampanga.

Fifty (50) participants composed of science and mathematics teachers, principals, supervisors, and IP focal persons from Region I and III were updated on the status of indigenization in the Philippine education system. The Indigenous Peoples Education Office (IPsEO)D of DepEd, reported its current initiatives and planned programs relative to IPEd.

Educators composed of Ms. Melodee Pacio (Philippine Science High School-Main), Ms. Erica Mae Reyes (Ateneo de Manila University), and Ms. Mary Rose Restum (Sta. Elena High School), who were all DOST graduate scholars, presented the results of their academic research on culture-based pedagogy and encouraged participants to conduct research in their respective schools.



Music can be used in teaching mathematics, as presented by the research of Ms. Melodee Pacio that involves Cordilleran music in learning patterns in primary school

Partner institutions, individuals hailed for steadfast support

The Institute recognized institutions and individuals who have supported the project, Teaching Science to Indigenous Pupils, since its commencement in 2015. The institutions which have greatly contributed to the remarkable accomplishments of the project in Region III are: 1) Department of Education Regional Office III; 2) DepEd Indigenous Peoples Education Office; 3) Burog Elementary School; 4) San Martin Elementary School; 5) Katutubo Village Elementary School; 6) Villa Maria Integrated School; and 7) Camias Resettlement Elementary School. The project owes its success as well to various individuals, most especially to the people who are directly coordinating government interventions to help the indigenous people of the province, as well as to the elders of the Ayta communities.

DOST-SEI spearheads development of assistive materials for visually impaired learners

Empowerment of non-SPED receiving mathematics teachers

Integrating or mainstreaming of students with learning disabilities in a regular class is a good practice towards inclusive education. The question now is, “Are our teachers ready to teach in a “mixed” class?”

With the aim of capacitating non-SPED receiving mathematics teachers of visually impaired (VI) learners, DOST-SEI conducted a *Disability-Inclusive Training in Science and Mathematics Education* from May 28 – 30, 2019 in Mandaluyong City. This is a continuing initiative of DOST-SEI in support of RA 7277 or the Magna Carta for Disabled Persons that aims to provide equal opportunity to quality education for learners with disability.



(clockwise, top to bottom) Certificates of Recognition are presented to DepEd supervisors (L-R) Mr. Montemayor, Mr. Sibal, and Mr. Bondoc; and to IP elders, Mr. Baclay and Mr. David in appreciation of their support to the project

Integrating or mainstreaming of students with learning disabilities in a regular class is a good practice towards inclusive education. The question now is, “Are our teachers ready to teach in a “mixed” class?”



Thirty-nine (39) teachers from Regions III, IV-A and NCR were trained on developing adaptive instructional materials in teaching mathematics for Grades 2, 3, and 4. The activity was in partnership with the Resources for the Blind, Inc. (RBI), International Council for Education of People with Visual Impairment (ICEVI), and the Department of Education (DepEd).

Teachers were prompted by Mr. Ryan Operario, Education Coordinator of RBI Cebu, to review the language or terms they use in class that can be ambiguous to visually-impaired (VI) learners. SPED teachers and advocates of inclusive education -- Ms. Julia Capulong, a retired teacher, Ms. Rhoda Nocum of Bagong Silangan Elementary School, and Ms. Leah Reyes of Ramon Magsaysay High School, guided the teachers in creating appropriate and effective adaptive materials.

Through the efforts of ICEVI, two speakers from Indonesia, Ms. Indah Luftiah and Ms. Lisda Fitriana Masitoh, shared their best practices and the adaptive materials they have developed in teaching a class with VI learners.



Subject experts from Philippines and Indonesia assist the participants on how to braille and in preparation of assistive materials using low-cost and local materials





Each Grade group presents their developed assistive materials in teaching selective topic in elementary mathematics to solicit suggestions on how to further improve the materials

(left) Mr. Operario, visually impaired, tries the usability of the assistive materials

(right) "Gallery" of final outputs



Exhibit visitors during the 2019 NSTW celebration wear blindfolds to experience and understand the challenges of their classmates with visual impairment in learning mathematics

Teacher Julia demonstrates to students a lesson which cultivates compassion of sighted learners toward their visually impaired school/classmate

(bottom) Participants learn how to properly guide visually impaired individuals, whose role is played by other participants, as they walk and pass through narrow corridors, and as they step up and down an elevated platform



Sharing the vision, spreading the advocacy of disability-inclusive education

Attainment of disability-inclusive education entails inter-agency efforts and participation of individuals. To widen the reach of the advocacy, the adaptive materials in teaching Mathematics for Grades 2,3, and 4 with VI learners were showcased in three (3) various events:

- Launching of "Learning Math Everywhere!", which featured sets of Mathematics Video for learners with visual impairment, organized by the Resources for the Blind Inc. (RBI), International Council for Education of People with Visual Impairment (ICEVI), and Nippon Foundation on July 18, 2019 in Quezon City. VI learners and their parents, teachers, and stakeholders attended the activity.
- 2019 National Science Technology Week (NSTW) Celebration on July 19, 2019 at the World Trade Center, Pasay City. The exhibit showcased the assistive materials, lesson demonstration, and practice on basic sighted guide techniques.
- First Philippine Accessibility Summit organized by the Office of the President Presidential Human Rights Committee Secretariat held on July 24, 2019 at the Heritage Hotel, Pasay City.



Trainers guide the participants in planning and writing their lessons in science and mathematics, an activity that fosters teamwork, collaboration and camaraderie.

Pedagogy training reaches more JLSS scholar-grads

In line with their agreement to render two years of teaching service in public or private high schools in their respective regions, scholars under the Junior Level Science Scholarship (JLSS) of RA 10612 attended a four-day training, dubbed as *Capacitating Scholar-Graduates with Pedagogical Skills*.

A total of 80 scholar-graduates benefited from the two batches of training, the first held in Iloilo City on April 9-12, 2019 for scholar-graduates from Region VI, the other held in Cagayan de Oro City on November 27-30, 2019 for those from Region X.

The training provided knowledge and practical strategies that strengthened their teaching skills and highlighted practical and innovative approaches in teaching science and mathematics. Their creativity and mastery of the subject matter were also put to test through demonstration teaching.

Dr. Sheryl Lyn Monterola, Dr. Edwehna Elinore Paderna, and Dr. Nympha Joaquin and Ms. Lady Angela Rocena, all subject experts from the University of the Philippines Diliman, served as trainers.



Trainers, participants, and DOST personnel at the Training of Mentors held on August 22-23, 2019 in Tabuk City, Kalinga

Mentoring Program Seeks to Improve Scholarship Availment

In its continuing commitment to enlist scholars from every municipality, the Institute developed an enrichment program for Grade 12 students in municipalities without or with low number of qualifiers. It was launched in Kalinga and Apayao in coordination with DOST CAR and Provincial S&T Centers in these provinces.

The project marked two phases of accomplishments:

- I. **Training of Mentors**
Twenty-four (24) teachers endorsed by DepEd Apayao and Kalinga underwent the Training of Mentors held on August 22-23, 2019 at the Golden Berries Hotel and

Convention in Tabuk, Kalinga. They were trained by faculty members from the Philippine Normal University-Manila on content mastery in English, Mathematics, Science and Mechanical-Technical, and effective review strategies to assist potential DOST scholars.

- II. **Review Sessions**
The review sessions serve as a mentoring program to aspiring DOST scholars, enriching their content knowledge in STEM subjects that also correspond to the domain covered by the DOST SEI Undergraduate Examination, and familiarizing them with the types/parts of the actual examination, thus, increasing their chance to qualify for the scholarship.

Six (6) review hubs were established in strategic locations to cover all municipalities of Kalinga and Apayao. (*see Table 20*)

The review sessions were held on four weekends of September, covering English, Mathematics, Science and Mechanical-Technical subjects. In addition, pre-test and post/mock tests were conducted to further prepare the attendees.

A total of 205 (109 Apayao, 96 Kalinga) Grade 12 graduating students who are members of the STEM strand and upper 5% of graduating class for non-STEM strand benefited from the mentoring program.

Table 20: Review hubs established for potential applicants to the DOST Undergraduate S&T Scholarship Programs		
Cluster	Covered Municipalities	Review Hub
Province: Apayao		
A.1	Luna, Sta. Marcela, Pudtol, Flora	Apayao State College (Luna)
A.2	Kabugao, Conner	Apayao State College (Conner)
A.3	Calanasan	Apayao National Industrial Agricultural High School
Province: Kalinga		
K.1	Tinglayan, Lubuagan	St. Theresita's School (Lubuagan)
K.2	Tabuk, Rizal, Pinukpuk, Tanudan	Kingsquare Davidson Hotel (Tabuk)
K.3	Pasil, Balbalan	Balbalan Agro-Industrial School (Balbalan)



Siyensya-bilidad, DOST-SEI developed review material, was used for the pre-test and post/mock-test. It features test items of domains covered by the qualifying exam and timed accordingly



Students listen intently to their mentor during review session in Apayao Cluster 1

(bottom left) Big step towards the future. Hopes are high and looking forward to the result of the DOST-SEI Qualifying Examination to be released in March 2020

Aspiring scholars from the municipalities of Tinglayan and Lubuagan



More science and mathematics teachers shine under Project STAR

STAR Series of Trainings

The Institute continued its capacity building activities for the benefit of science and mathematics teachers under the Science Teacher Academy for the Regions or Project STAR, which operates in partnership with 16 universities nationwide. For 2019,

15 trainings were held from March to December with a total of 1,334 participants as beneficiaries. (see Table 21)

Manual for STAR Trainings (ManSTAR)

A STAR Training Manual was completed to serve as guide on the management, supervision, and conduct of the various trainings under the project. The manual is divided into three main parts: (1) Training Management, including procedures during preparation, implementation, and post-implementation; (2) Project STAR Trainings, including objectives and sample training designs; and (3) Monitoring and Evaluation, which includes instruments used in these activities. It is expected that the manual will undergo revision with the addition of future trainings as well as with improvements in the processes.

Table 21: 2019 STAR Trainings Conducted			
Date (2019)	Title of Training	Venue	No. of Beneficiaries/ Participants
March 19-21	Language Strategies in Teaching Science and Mathematics	Leyte Normal University	95
April 10-12	Language Strategies in Teaching Science and Mathematics	CARAGA State University	100
April 11-13	Design Thinking for K-3 Science and Mathematics Teaching	Tacloban City	43
April 23-25	Language Strategies in Teaching Science and Mathematics	Western Mindanao State University	102
April 23-25	Language Strategies in Teaching Science and Mathematics	Saint Mary's University	107
May 06-08	Language Strategies in Teaching Science and Mathematics	Saint Louis University	101
May 17-19	Design Thinking for K-3 Science and Mathematics Teaching	Quezon City	39
May 21-23	Language Strategies in Teaching Science and Mathematics	Palawan State University	105
May 29-31	Design Thinking for K-3 Science and Mathematics Teaching	Vigan, Ilocos Sur	39
July 25-27	Language Strategies in Teaching Science and Mathematics	University of Southern Mindanao	105
September 11-13	Language Strategies in Teaching Science and Mathematics	Batangas State University	98
October 1-3	Language Strategies in Teaching Science and Mathematics	University of South-eastern Philippines	98
November 18-20	Design Thinking for K-3 Science and Mathematics Teaching	Pangantucan, Bukidnon	53
December 3-5	Language Strategies in Teaching Science and Mathematics	DepEd Ecotech, Cebu City	124
December 9-11	Language Strategies in Teaching Science and Mathematics	City Garden Suites Manila	125

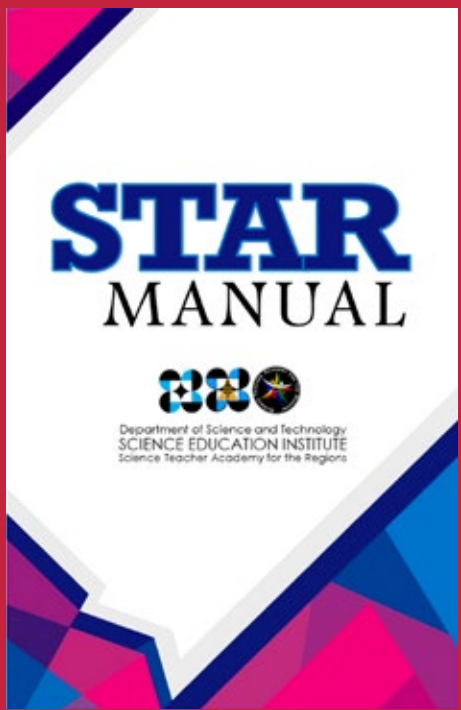




Photo opportunity of participants with resource person Ms. Josephine Gepigon, of University of Southeastern Philippines (sitted)



Participants of the training "Language Strategies for Teaching Science and Mathematics" developing their lesson in preparation for the lesson demonstration

Participants listening intently to instructions of the workshops for the training "Design Thinking for K-3 Science and Mathematics Teaching"



A participant actively sharing her views, as resource person Mr. John Paul Ongcoy listens at the training "Language Strategies for Science and Mathematics" held at the University of Southern Mindanao (USM)

Evaluation of the Effectiveness of STAR Trainings

The final stage of this research undertaking was content analysis where lesson plans developed during STAR trainings conducted in six regions namely- Regions 1, 3, 5, NCR, 6 and 10 were measured as to the attainment of training objectives. Three to five lesson plans were randomly chosen and subjected to analysis by three trainers based on the participants' perception regarding the relevance and usefulness of STAR training to their teaching practice, and the extent and quality of adoption of the training content.

Monitoring of STAR Trainings (MonSTAR)

Monitoring and evaluation was conducted to determine the effect of Project STAR trainings on the teaching practice of teacher-participants. Three regions were identified for the activity- Region 3, Region 6 and CARAGA. Participants

from these regions were invited by a facilitator for an interview schedule in a focused group discussion. Two (2) participants from the FGD (one science and one mathematics teacher) were chosen for the school visit and classroom observation. During the school visit, trainers observed the classes and conducted interviews with the participant, the students, the supervisor and the principal. A classroom observation rubric was used to assess the teacher. The results of the monitoring and evaluation are expected to be completed by the second quarter of CY 2020.

STAR Channel

STAR Channel is a venue for viewing localized and contextualized STEM lessons on YouTube or SEI-DOST website. Lessons are to come from entries submitted by elementary, high school and college teachers in the Philippines.

These are the Categories:

- Concept builders
- Short tutorials

- Do-it-yourself instructional materials
- Teaching aids for hard-to-demonstrate topics
- Pedagogical practice and professional community development

The announcement was posted on the Project STAR Facebook page. The deadline for the submission of entries was set on November 24, 2019.

e-STAR

The e-STAR, or the on-line platform for Project STAR accessible at www.e-star.ph was updated and revised with new training outputs that included lesson exemplars and sample activities. This facility aims to provide teachers with increased access to learning resources for improved teaching and learning of science and mathematics. It also serves as a venue to disseminate information about the services and activities of the project and encourages collaboration among science and mathematics teachers.

Recipients of Project STAR Trainings

“STAR training was very relevant, informative, and crafted in such a way that it not only enlightens the mind but touches the heart as well. It opened new doors for more opportunities to learn from very brilliant and inspiring people who share the same passion to improve education. Indeed, being a recipient of the STAR Trainings had been a very amazing and fulfilling experience.”

– GEYLEN ABAINZA, Region V

“Through STAR trainings a promise has been made to be fulfilled. When I was asked in one of my interviews, I made a promise that I can be an agent of change and inspirations and through STAR I was able to fulfill this by utilizing the skills and concepts I learned in the STAR academy among my fellow science teachers. Also, through the trainings I shared, it inspired many teachers in my region in striving to be a better teacher everyday by making a difference in the lives of the learners.”

– JOHNNY SAMINO, Region V

“Out of the thousand teachers in the Philippines, it is fulfilling to note that I was given the opportunity to be a part in the different forums of DOST-SEI. This gives me the best platform to be updated with the latest issues, trends, and innovations that could be used in my daily activities related to my functions now as education program supervisor. This is also a good avenue for me to establish my ecosystem of support by enriching my biosphere of influence.”

– MARY ANN GRACE DULAY, Region I

“The STAR Training motivates me to create innovative techniques that would develop students’ life-long learning skills through active engagement in learning process using the inquiry-based approach and the 7Es Instructional model. In this approach, the students are encouraged to learn and give a deeper meaning of the concept on their own, ask and find answers to their questions and perform the activity independent of the teacher.”

– RUSSELL GORRE, Region VI

“My STAR trainings improved my prospects for the future because they cultivated my innovative, creative, communicative, and collaborative competence which were my driving forces towards a just, inclusive and sustainable future.”

– REX SARIO, Region X

“I am very excited about making meaningful connections to contribute to innovative activities and projects in the future with the learnings I gained from STAR training. Implementing and promoting powerful new teaching strategies in STEM education.”

– MARY GRACE BUMANLAG, NCR

“After the STAR training, I am looking forward to a productive, committed, and performance-based service to the Department of Education. The unwavering support of DOST-SEI will be continued until it will be extended to the teachers serving in the far-flung communities.”

– GUADALUPE BLANCO, Region X

“We view the Philippines as a strategic partner in academic and research activities. We are expecting to enhance the scope of this partnership by supporting Palawan State University for Petroleum Engineering curriculum development in accordance with the Washington Accord accreditation. From these new initiatives, we hope to see DOST-SEI support in building a great partnership between PSU and UTP towards developing a successful Petroleum Engineering teaching and learning hub for ASEAN and the world.”

PROF IR DR MOHD SHAHIR LIEW
Deputy Vice Chancellor for Research and Innovation
Universiti Teknologi Petronas
Seri Iskandar, Perak, Malaysia



1st International Conference on Science Education

The first Project STAR international conference on science education was successfully staged at the Philippine International Convention Center (PICC) on August 7-9, 2019. The conference gathered 350 educators, education policy makers, and experts in the Asian region to discuss and share the current state of international science and mathematics education. With the theme “*Perspectives in Science and Mathematics Education: Building Connections, Sharing Pedagogies and Sustaining Innovations*”, the conference consisted of seven plenary sessions where paper presentations were made by the representatives from Singapore, Hongkong, Australia, Korea, Taiwan, Thailand and the

Philippines, 10 workshops, 35 parallel paper presentations, 12 stories of STEM innovations, and a round table discussion among educators and specialists.

The conference was able to build strong professional relationships between

fellow teachers, researchers, and experts in science education, enabling them to gain new perspectives and insights in their field. In addition, teachers were updated on various pedagogical practices that have been evolving at increasingly faster rates especially in the last decade.

The conference was able to build strong professional relationship between fellow teachers, researchers, and experts in science education.



Speakers, guests and delegates of the 1st DOST-SEI STAR International Conference pose at the main staircase of the Philippine International Convention Center (PICC)

DOST-SEI develops Competency Based Human Resources System Manual

Currently under completion, a manual on Competency Based Human Resources System (CBHRS) was initiated by the FAD-Human Resource Management Unit (HRMU) in collaboration with the various units of the Institute after the conduct of an in-house training program from February to May 2018.

- The CBHRS workshops had the following modules:
- 1) Competency Modeling and Profiling
 - 2) Development of Competency-based Qualification Standard and Job Description
 - 3) Competency Assessment
 - 4) Integration of Competencies in the HR System

From August 2018 to January 2019, four coaching sessions on the system were also conducted by subject matter experts, who also lent their expertise in writing the manual.

The manual shall serve as a guide in the understanding of the CBHRS and as a reference material for future evaluation and assessment to ensure developing “the right person with the right fit in the right position and ready at the right time.”

The CBHRS reflects the Institute’s compliance with the external audit report of TUV Rheinland on the Recommendations and Opportunities for Improvement (ROI) of the HRMU in accordance with ISO 9001:2008 standard conducted in 2016. The training program was likewise conducted to comply with the requirements of the Civil Service Commission to implement its Program to Institutionalize Meritocracy and Excellence in Human Resource Management (PRIME-HRM), in alignment with the Sustainable Development Goal on having effective, accountable and transparent institutions at all levels.



One group of the training doing a contextualized lesson on DRRM for Grade 11-12

Mr. Jeffrey Perez, Geologist of Philippine Institute of Volcanology and Seismology (PHIVOLCS) talking about volcanos in the training “Strengthening the Capacity of STEM Teachers on DRRM” held at Cagayan, Isabela

STEM senior HS teachers of Isabela train on disaster risk reduction and management.

Forty eight (48) STEM senior high school teachers of the divisions of Isabela were trained on disaster risk reduction and management (DRRM) held on October 8-10, 2019. The site was deemed ideal for the training due to Isabela’s vulnerability to natural disasters. The training was contextualized to make learning meaningful for the teachers and ultimately relevant for teaching students in their locality. The training focused on lectures and activities on scientific concepts related to typhoons, floods, earthquakes, volcanoes, tsunami, and landslide, as well as other disaster-related topics like community-based flood



early warning system (CBFEWS), Philippine Disaster Risk Management Plan, and climate change. Experts from PHIVOLCS, PAGASA, Office of Civil Defense, Mines and Geosciences Bureau, DOH, and Red Cross served as resource persons.

The output of the training was a contextualized lesson on DRRM for Grades 11-12 based on the K-12 curriculum and using the inquiry-based approach in teaching.

DOST-SEI strengthens partnership with foreign network institutions

To ensure the sustainability of its program called Foreign Graduate Scholarships in Specialized Priority Fields in Science and Technology, the Institute continues to widen the range of foreign universities in which its deserving scholars may enroll to pursue their MS and PhD degrees in highly specialized and emerging fields not yet offered in the country.

These partnerships also foster friendly cooperation in other areas such as joint research cooperation, sandwich program, exchange faculty/student program, visiting professorship among others. These partnerships include the following:

- 1. **DOST-SEI-UAlberta Graduate Scholarship Program** aims to create mechanisms for doctoral and master’s degree students from the Philippines to study and conduct research at University of Alberta (UAlberta) with support provided jointly through DOST-SEI scholarships and UAlberta. Students who will enroll in the following thesis-based master’s and doctoral fields are eligible to apply for the scholarships: agricultural, food and nutritional science; biochemistry; cell biology; chemical and material engineering; computing science; earth and atmospheric science; electrical and computer engineering; integrated petroleum geoscience; renewable resources; and physics.
- 2. **PhilFrance-DOST Fellowship Programme** aims to foster the mobility to the French Republic of Filipino professionals working in academic, research or government institutions selected on the basis of academic excellence. The awardees of the program shall pursue Master’s degree or Doctorate degrees issued by public higher education establishments under the Ministry of National Education, Higher Education and Research of the French Republic. The priority

fields of the program are agriculture, veterinary science, forestry, natural resources and environment, climate change, nuclear application on health, biological sciences, health and medical research, material science, and other priority fields that may be identified by both parties.

- 3. **Collaboration with the James Cook University (JCU) of the Commonwealth of Australia** promotes scientific and technological cooperation between the DOST and JCU. It provides capacity building initiatives in areas such as marine sciences, biodiversity, tropical ecology and environments, global warming, tropical medicine, and public health care.
- 4. **Foreign Graduate Scholarship in Energy Engineering and Related Fields at the Universiti Teknologi Petronas in Malaysia.** Following the early completion of eight (8) MS

by PCIEERD starting AY 2019-2020, DOST-SEI funded the scholarship of Filipino scholars in Hokkaido and Tohoku universities and Kyushu Institute of Technology in Japan.

- 6. **Graduate Degree Programs in Nuclear Energy and Space Science Technologies** provides opportunity for Filipino professionals to pursue graduate studies in any university in Russia. The Russian government covers the tuition fees of the scholar for the entire period of study, monthly expenses and visa processing fee. DOST-SEI, on the other hand, shoulders other expenses such as airfare, medical insurance, monthly living expenses and relocation allowance.
- 7. **MECO-TECO Sandwich Program** allows the DOST-SEI scholars to conduct part of their research under the supervision of host scientists/professors in any university in Taiwan.

SEI continues to widen the range of foreign universities in which its deserving scholars may enroll to pursue their MS and PhD degrees in highly specialized and emerging fields not yet offered in the country.

Petroleum Engineering scholars at UTP, additional scholarship slots were provided covering additional degree programs such as Drilling Engineering, Offshore Engineering, and Petroleum Geoscience for faculty members of the Palawan State University. The PSU has a clear vision of developing graduate programs in Petroleum and other related engineering programs.

- 5. **Developing Capabilities in Space Science and Technology.** For the capacity development program in support of the Philippine Microsatellite Program initially funded

DOST-SEI also started the initial coordination with other institutions for future collaboration. These include coordination with the Embassy of the Philippines in Canada for graduate programs in other universities in Canada; collaborative programs for MS Nanotechnology and Biomedical Engineering in Iran; and together with the DOST’s Philippine Council for Health Research and Development (DOST-PCHRD), Capacity Building for S&T Personnel in Biomedical Devices Innovation and Research to be coordinated with United Kingdom and Australia.

Article on DOST-SEI study on ICT integration in teaching submitted for publication in a scientific journal

The Institute submitted an article entitled “Will-Skill-Tool (WST) Model of Technology Integration in Teaching Science and Mathematics in the

Philippines” to the international scientific journal Computers in Education. The article presents the factors that influence ICT integration in science and mathematics teaching, providing insights on how to maximize its benefits in the teaching and learning process.

Below is the abstract of the journal article:

.....

The proliferation of information and communication technologies (ICT) in the 21st century has challenged the status quo of educational setting and led to a paradigm shift in teaching and learning processes. ICT use and integration in teaching then, becomes an essential component of pedagogical processes to have an effective teacher-student interaction and to optimize learning. While past studies have already established evidence that attitude toward ICT (will), ICT skills (skill), and availability of ICT resources (tool) elements are indeed important contributors to the integration of ICT in teaching, little attention has been paid yet to differences in these elements and in this model of ICT integration between subject areas of science and mathematics. Thus, this study explores this gap attempting to examine the significant differences in these factors between science and mathematics (S&M) teaching guided by the Will-Skill-Tool (WST) model developed by Christensen and Knezek (2001, 2008). Using independent samples t-test and multiple linear regression, results show that science teachers had higher scores in will, skill, tool, and ICT integration indices compared to mathematics teachers. Findings also revealed that WST model of ICT integration differs between science and mathematics areas, particularly in terms of which among the factors had the strongest influence on ICT integration. The study recommends distinct approaches in providing capacity training development on ICT integration for teachers considering the context of subject-specific area.

.....

DOST-SEI conducts more gender-responsive initiatives

DOST-SEI has long been implementing various initiatives that ensure gender mainstreaming and gender-responsiveness of its programs. In addition to providing equal opportunities to Filipino citizens regardless of gender, the Institute equips its employees with the capacity to substantively address gender-related issues in STEM education.

Reconstitution of the Gender and Development Focal Point System

DOST-SEI reconstituted its Gender and Development Focal Point System to lead in advocating, guiding, coordinating, and monitoring the development, implementation, review and update of GAD plans and GAD-related programs, activities and projects (PAPs).

Attendance to the DOST-Wide Women’s Month Celebration

Employees of DOST-SEI participated in the 2019 DOST-Wide Women’s Month Celebration held on March 19, 2019 at the Hotel Jen in Manila. The activities include a dance competition highlighting women’s contribution in the development of the country and society. A singing contest was also held where songs used encourage and inspire women. The event also recognized some of the outstanding women who contributed great efforts to what DOST is today.

Conduct of the Women Inspiring Women Forum

As part of the 2019 National Science and Technology Week, DOST-SEI’s GFPS organized Women Inspiring Women Forum, which aims to address the global gender issue of the gender gap in the fields of STEM education. The event was held on July 19, 2019 at the Philippine International Convention Center, Pasay City with more than 100 high school students attending.

Three well known young women in the fields of STEM shared their stories with the participants. They are: Dr. Gay Jane Perez, a remote sensing



DOST-SEI representatives Jemmalyn Miniao (left) and Ma. Angelica Vistan (right) during the singing competition round of the 2019 DOST-Wide Nat’l WMC

(topmost) Bicutan Cluster getting ready to perform their dance piece for the DOST-Wide Women’s Month Celebration Dance Contest

(L-R) Ms. Gay Jane Perez, Ms. Maria Isabel Layson and Ms. Jakellen Prado answer the student’s questions during the question and answer portion of the Women Inspiring Women Forum 2019



Attendees watch AVPs of different DOST-SEI projects as they wait for the start of the program



Female students from Bangkal High School receive their learning kits before the start of the program

expert; Ms. Jakellen Del Prado, an oceanography researcher; and Ms. Maria Isabel Layson, 2018 Gokongwei Brothers Foundation Young Scientist Awardee and 2017 Science Camp participant.

Conduct of the GFPS-TWG Planning Workshop

The Gender and Development Focal Point System conducted a planning workshop last Aug. 7-9, 2019. The TWG crafted the GAD Agenda and the GAD Plan and Budget 2020 to address pressing issues and concerns on gender.

Activities in support of the campaign to end Violence Against Women (VAW)

- **Bagahe Film Screening.** In observance of the 18-Day Campaign to End Violence Against Women (VAW) 2019 with the theme “VAW-free Community Starts with Me”, DOST-SEI held a special film-screening of the PCW-endorsed film Bagahe.





DOST-SEI Employees joined by few from PCIEERD pose for a group photo after the viewing of the film Bagahe



Krav Maga trainer Atty. Jose Hipolito Jr. teaches DOST-SEI Employees right open position in self-defense

(bottom) Ms. Janine Florendo (left) and Ms. Ma. Nerissa Nicolas (right) practice the right techniques to defend themselves from an attacker holding a knife



Bagahe explores the life of an OFW, named Mercy, who is suspected of abandoning a newborn child in a trash bin of an airplane toilet. The film shows what happens to her while being investigated. The film touches on heavy topics such as abuse of OFWs, violence on women, government bureaucracy and many others, leaving its audience an opportunity to change the way they think and act upon.

- **Conduct of Krav Maga self-defense training.** The GFPS also spearheaded the conduct of a self-defense training last December 6, 2019 to capacitate DOST-SEI personnel with the ability to defend themselves in an event of unwanted attack. Krav Maga is a form of self-defense and physical training, first developed by the Israeli army in the 1940's, based on the use of reflexive responses to threatening situations. The training conducted by Atty. Jose Hipolito Jr. was participated in by 12 SEI employees and focused on self-defense techniques for knife attacks.



DOST-SEI Employees with Krav Maga Trainer Atty. Jose Hipolito Jr.

- **Conduct of DOST-Wide Anti-VAW Campaign.** The DOST Central Office also organized a DOST-Wide anti-violence against women campaign attended by all DOST employees in Bicutan, Taguig. All DOST attached agencies presented their own commitments to end VAW.

During the program, DOST-SEI, as the science and technology human resource development agency of DOST, has declared its commitment to do its part to the attainment of a VAW-free community, in DOST and in the Philippines at large. The Institute pledged to continue to spread awareness and educate the students and scholars so that they can live a life free from violence. DOST-SEI vows to ensure that there will be zero tolerance to VAW and to foster an environment believing that both men and women are vital for development.

The event also showcased a little talent show featuring the employees of DOST as they campaign against violence on women through different ways such as singing, dancing, acting and speech choir.

Employees of DOST campaigning against violence on women through a singing and dancing





GAD Focal Point System members from different DOST agencies in the Metro convene for the conduct of the Gender Analysis Training

Members of the GAD Focal Point System from all DOST regional offices and attached agencies join together for the GAD Focal Point Assembly



Training/Workshop on Gender Analysis

On Aug. 21-22, 2019, the DOST-GAD Central Office conducted a training workshop on Gender Analysis for capacity building of the GAD Focal Point System of all attached agencies and regional offices. The training aims to develop the ability of the members of the GFPS to conduct gender analysis on their respective agencies and clients, which would help them better see the situation and formulate right programs and activities addressing pressing gender issues and concerns.

The two-day seminar also included lessons on how to translate the Gender Analysis results in the GAD Plan and Budget.

The event was held at the Crosswinds Hotel and Suites at Tagaytay City and was attended by Ms. Imelda S. Sario, the GAD chairperson and Ms. Jasmin Coleen Y. Intia, GAD secretariat.

Attendance to the GAD Focal Point Assembly 2019

As part of the gender mainstreaming strategy, the DOST-GAD Central Office annually invites members of each agency's GFPS to attend this activity. The assembly, held in Puerto Princesa, Palawan on November 4 to 8, 2019, was focused on capacitating the GFPS in crafting the six-year plan for GAD-ES.

The five-year plan, also known as GAD Agenda, will enable the agencies to track their progress and align their yearly GAD plan and budget to a bigger goal addressing greater concerns. A sharing of agencies' best practices also took place during the event.

Inspiring girls in Aerospace Engineering through the NuLab Project

The GFPS has partnered with the project Nulab, DOST-SEI's mobile classroom/lab, to hold all-female sessions for Nulab where Dr. Rogel Mari Sese discussed Aerospace



Female students complete Aerospace Engineering module taught by Dr. Rogel Mari Sese during the all-female session in Nulab's Trip to Los Banos

Engineering. Under the theme, "Breaking Gender Roles," DOST-SEI encourage girls to pursue STEM courses, by experiencing actual encounter with scientists and exposing them to male-dominated STEM disciplines. GAD Kits were also provided during the sessions as part of the social marketing campaign of mainstreaming GAD.

DOST endorses applicants for S&T Eligibility Specialists


In 2019, a total of 25 applicants were approved and endorsed by the DOST Secretary to the Civil Service Eligibility (CSC) Central Office and various concerned CSC Regional Offices for the grant of S&T Eligibility Specialist under PD No. 997.

PD No. 997 allows for the conferment of this rank to a scientific or technological specialist who gained knowledge through advanced education and who honed their skills by actual research and teaching. It is designed to encourage more S&T professionals to get into public service and contribute to research and innovation in the country.

The applicants were evaluated by the Technical Working Group and the Presidential Committee on the bases of their qualifications and the requirements of public service, as provided by the Law. Table 22 shows the number of qualified applicants by S&T fields.

Table 22: Number of Qualified Applicants by S&T Fields: PD No. 997, 2019

Science and Technology (S&T) Fields	Sex		Total
	Male	Female	
Doctorate Degree			
Master's Degree	5	5	10
Teaching Experience	7	5	12
Research Experience	2	1	3
Total	14	11	25



RELEVANT AND EFFECTIVE LEARNING OUTCOMES

The ultimate aspiration of our education for sustainable development is to bring out individual competencies and empower all our stakeholders, from students and teachers to partners and communities. Through science education, we aim to equip students with an understanding of the complexity and causes of societal challenges on a global perspective, integrate their knowledge and skills into real-world situations, and create opportunities to showcase their discipline-specific capabilities alongside their peers on a national and global level.

This section narrates how we are enabling the nation to make headway in advancing our capabilities in the areas of science, technology, engineering, and mathematics, as seen in the Filipino youth's continuous demonstration of excellence here and abroad. But more than expanding the learners' qualifications, the Institute seeks to continually increase their ability to use their skills to effectively create solutions to societal challenges of today and tomorrow, and thus further elevate the Filipinos' quality of life.

SECTION 4 SDG CATEGORY AND ACTIVITIES	4 QUALITY EDUCATION	5 GENDER EQUALITY	8 DECENT WORK AND ECONOMIC GROWTH	10 REDUCED INEQUALITIES	17 PARTNERSHIPS FOR THE GOALS
PMO AND IMO	👍				👍
TAGISANG ROBOTICS COMPETITION	👍				👍
IMAKE.WEMAKE: CREATE. INNOVATE. COLLABORATE	👍			👍	👍
4TH INDIE-SIYENSYA FILMMAKING COMPETITION	👍			👍	👍
CLIMATE SCIENCE YOUTH CAMP	👍			👍	👍
EVALUATION OF CAREER INCENTIVE PROGRAM			👍	👍	
YES AWARD	👍			👍	👍
DOST-SEI SOCIAL MEDIA ENGAGEMENTS	👍	👍	👍	👍	👍
RECOGNITION OF YOUTH STEM COMPETITION ORGANIZERS	👍				👍
NSTW AND RSTW	👍	👍	👍	👍	👍



ALL SMILES. The twenty-one (21) finalist of the 21st Philippine Mathematical Olympiad (PMO) from left to right (standing) Bryce Ainsley Sanchez of Grace Christian College, Immanuel Josiah Balete of St. Stephen's High School, Steven Reyes of Saint Jude Catholic School, Gabriel Joseph Pua of St. Stephen's High School, Eion Nikolai Chua of International School Manila, Dominic Lawrence Bermudez of PSHS – Main Campus, Lawrence Gabriel Dy of CCF Life Academy Foundation Inc., Dion Stephan Ong of Ateneo de Manila Senior High School, Ryan Mark Shao of Xavier School and Vincent Dela Cruz of Valenzuela City School of Mathematics and Science (sitting from left to right) Lance Adrian Ko of St. Stephen's High School, Sarji Elijah Bona of Palawan Hope Christian School, Sean Anderson Ty of Zamboanga Chong Hua High School, Aeram Clester Albo of De La Salle University Integrated School – Manila, Jinger Chong of Saint Jude Catholic School, Gwyneth Margaux Tangog of Southville International School and Colleges, Filbert Ephraim Wu of Victory Christian International School, Enzo Rafael Chan of Bayanihan Institute, Dan Alden Baterisna of De La Salle University Integrated School – Manila and Issam Wang of Manila Science High School

Filipino math students shine in national and international competitions

The Philippine Mathematical Olympiad (PMO), the oldest and most prestigious nationwide mathematics competition among high school students, set the initial stage once again in selecting the year's best math wizards among high school students.

In its 21st year, the PMO drew 4,517 students in the qualifying stage, out of which 222 were selected to proceed to the area stage which was held in regional testing centers nationwide on November 24, 2018.

From here, the top 22 students moved up to the National Stage of the competition, which was held on January 26, 2019 at the SOLAIR Auditorium, UP Diliman, Quezon City.



The top 3 winners (from left to right) Vincent Dela Cruz of Valenzuela City School of Mathematics and Science (2nd Runner up), Bryce Ainsley Sanchez of Grace Christian High School (Champion), and Sean Anderson Ty of Zamboanga Chong Hua High School (1st Runner up)

The top three (3) winners in the 21st PMO went on to represent the country in the International Mathematical Olympiad (IMO) after a rigid training and final selection process. (see Table 23)

Impressive showing at the IMO

The Philippine contingent to the 60th International Mathematical Olympiad (IMO) claimed an impressive win as all six members of the team won a medal in the oldest and most prestigious of the international scientific olympiads.

The national team brought home one silver and five bronzes against more than 600 other contestants in the competition held in Bath, United Kingdom from July 11 - 22, 2019.

The Philippine Team raising our flag during the Opening Ceremony of the 60th International Mathematical Olympiad.

Table 23: 2019 Winners in the Phillippine Mathematical Olympiad		
Name	School	Award/Prize Received
BRYCE AINSLEY SANCHEZ	Grace Christian High School	Champion/1st Place P20, 000, Trophy, Medal, Certificate and SHARP Calculator with SHARP goodies
SEAN ANDERSON TY	Zamboanga Chong Hua High School	1st Runner up/2nd Place P15, 000, Trophy, Medal, Certificate and SHARP Calculator with SHARP goodies
VINCENT DELA CRUZ	Valenzuela City School of Mathematics and Science	2nd Runner up/3rd Place P10, 000, Trophy, Medal, Certificates and SHARP Calculator with SHARP goodies





PHILIPPINE IMO TEAM. The Philippines' representatives at the 60th International Mathematical Olympiad (IMO) held last July 11-22, 2019 in the United Kingdom all brought home medals. (Front, L-R) Vincent Dela Cruz (Valenzuela City School of Mathematics and Science), Sean Anderson Ty (Zamboanga Chong Hua High School), Immanuel Josiah Balete (St. Stephen's High School), Deputy Leader Dr. Christian Paul Chan Shio, Trainer Mr. Ruselle Guadalupe and Team Leader Dr. Richard Eden. (Back, L-R) Dion Stephan Ong (Ateneo de Manila Senior High School), Andres Rico Gonzales III (De La Salle University Integrated School) and Bryce Ainsley Sanchez (Grace Christian College)

This is the second time, after the 58th IMO in 2017, that all six representatives won a medal. The Philippines also ranked 31st out of 112 countries, up from last year's 38th out of 107 countries.

Leading the medal haul is Sean Anderson Ty of Zamboanga Chong Hua High School who nabbed a Silver Medal. This is his second medal in the IMO, following a Bronze in 2017 and an Honorable Mention in 2018.

Math whiz Andres Rico Gonzales III of De La Salle University Integrated School secured a Bronze Medal on his second IMO. He received an Honorable Mention in 2018.

The rest of the team, all first-timers, also won Bronze Medals: Immanuel Josiah Balete of St. Stephen's High School, Vincent Dela Cruz of Valenzuela City School of Mathematics and Science, Dion Stephan Ong of Ateneo de Manila Senior High School, and 2019 Philippine Mathematical Olympiad Champion Bryce Ainsley Sanchez of Grace Christian College.

Dr. Richard Eden from the Ateneo de Manila University, and Dr. Christian

Paul Chan Shio from the UP-Institute of Mathematics led the Philippine Team as Team Leader and Deputy Team Leader, respectively. Mr. Ruselle Guadalupe from the Mathematical Society of the Philippines (MSP) joined them as Trainer. The Philippine participation in the IMO was jointly organized by SEI-DOST and the MSP.

New basketball gameplay challenges Tagisang Robotics Teams

Since 2011, Tagisang Robotics: Design, Build, Play Competition offers a platform for high school students to develop their high-level cognitive and non-cognitive/transferrable skills such as problem solving and critical thinking, creativity, teamwork, communication skills and conflict resolution through robotics.

After four years in hiatus, Tagisang Robotics took things to a whole new level in 2019 by challenging 16 public high school teams from NCR, Region III and IV-A to design, program, and build robots, and play with an alliance on a new varsity game that strikes closest to the hearts of Filipinos

– Basketball. The 16 participating schools were selected from the roster of school teams in the 2014 Tagisang Robotics Competition (TRC):

1. Bangkal High School
2. Benigno "Ninoy" S. Aquino High School
3. Caloocan National Science and Technology High School
4. Makati Science High School
5. Malabon National High School
6. Manila Science High School
7. Marcelo H. del Pilar National High School
8. Muntinlupa National High School – Main
9. Pasig City Science High School
10. Philippine Science High School Main Campus
11. Pitogo High School
12. Rizal High School
13. Rizal National Science High School
14. Sen. Renato "Compañero" Cayetano Memorial Science & Technology High School
15. Taguig Science High School
16. Valenzuela School of Mathematics and Science

Guiding DOST-SEI in crafting the game mechanics and guidelines were

experts in the field of electronics and communications engineering namely, Dr. Edison Roxas of the University of Sto Tomas, Engr. Carlos Matti Oppus of Ateneo de Manila University, and Engr. Percival Magpantay of the University of the Philippines.

Each school team, composed of four (4) high school students, was provided with a microcontroller unit, gears and motors, which they used during the 5-day Technical Training and Workshop held on September 17-21, 2019 at the PHIVOLCS Auditorium, Quezon City. School teams were required to build and program their robot to score by moving autonomously during a portion of each match, as well as successfully

shoot balls into their designated goals elevated at 4 feet and 6 feet, each having a different point equivalence in a longer part of the match where robots are remotely controlled.

After the training, the school teams went on to the build phase where they were given 60 days to finish their prototype. Teams needed to comply with the 2x2x2 feet dimension and 15 kilogram weight limit in order to play in the Final Competition that was held on November 18-20, 2019 at the Forum 2, Philippine International Convention Center, Pasay City.

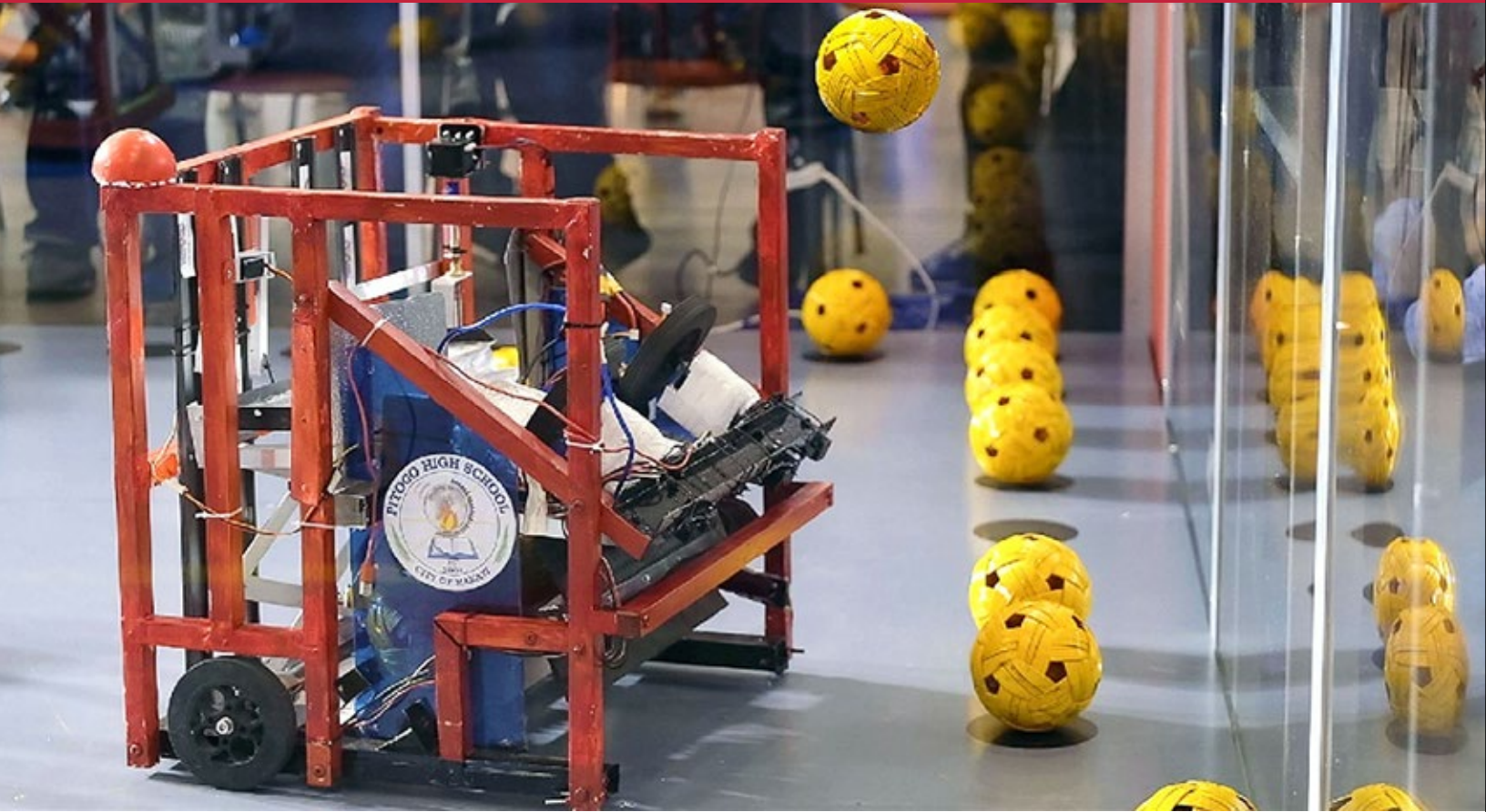
Mastering the basic: Caloocan National Science and Technology High School Robotics Coach Mr. Rex Mendel Capili carefully guides his students in solving electric circuit problems that is one of the critical skills to achieve success and confidence in building their own robot



School teams went through seven (7) rounds of elimination matches to determine the teams that would advance in pairs (red and blue) to the semi-finals and final rounds. Pitogo High School dominated the elimination rounds by securing the 1st seed with 6 win – 1 loss record. The school previously won the Best Rookie Team Award and Best Team Award in 2013 and 2014, respectively.

After four years in hiatus, Tagisang Robotics took things to a whole new level in 2019 by challenging 16 public high school teams to design, program, and build robots, and play with an alliance on a new varsity game that strikes closest to the hearts of Filipinos–Basketball.

With their robot, Pitogo HS Team attempts a shot in one of its wins making their way to being hailed as the Best Team in the 2019 Tagisang Robotics Competition



In the semi-final round, Pitogo High school then paired with Rizal National Science High School and went against the opposing alliance of Malabon National High School and Caloocan National Science and Technology High School. Second seed Rizal High School partnered with Sen. Renato “Campañero” Cayetano Memorial Science and Technology High School to play against the alliance of Makati Science High School and Valenzuela School of Mathematics and Science.

In the end, the team of Malabon National High School and Caloocan National Science and Technology High School went on to win the championship round and claimed the Best Alliance Award with a cash prize of P150,000. Their coaches each received P15,000. Pitogo High School went home with P100,000 and was hailed as the Best Team by having the best win-loss record in the elimination round and their coach received P30,000 in cash.



Tagisang Robotics Competition 2019 Competition Results:

LIST OF WINNERS			
Award	School	Region / City	Prize
Best Team Award	Pitogo High School	NCR – Makati City	Php 100,000.00
	Malabon National High School	NCR – Malabon	Php 150,000.00
Best Alliance Award	Caloocan National Science and Technology High School	NCR – Caloocan City	

FINALS ROUND	
School	Region / City
Makati Science High School	NCR – Makati City
Malabon National High School	NCR – Malabon
Caloocan National Science and Technology High School	NCR – Caloocan City
Valenzuela School of Mathematics and Science	NCR – Valenzuela City

SEMI-FINALS ROUND	
School	Region / City
Pitogo High School	NCR – Makati City
Malabon National High School	NCR – Malabon
Caloocan National Science and Technology High School	NCR – Caloocan City
Rizal National Science High School	Region 4A – Rizal Province
Makati Science High School	NCR – Makati City
Valenzuela School of Mathematics and Science	NCR – Valenzuela City
Rizal High School	NCR – Pasig City
Sen. Renato “Campañero” Cayetano Memorial Science & Technology High School	NCR – Taguig City

THREE PEAT. For the third time, Pitogo High School secured the Best Team Award in the returning Tagisang Robotics Competition organized by DOST-SEI

2019 imake.wemake competition draws more innovative entries

Marking its third year in 2019, the imake.wemake: create. innovate. collaborate project aims to improve the students' engineering and technical proficiencies, as well as develop their communication, critical and analytical thinking skills by pitching, building, and presenting their science and technology projects that address important societal and community issues.

For the year, the competition received 84 project proposals from different schools nationwide. The Board of Judges selected the projects proposed by 15 school teams whose members and coaches were provided Technical Training and Workshop and present their improved proposals during the Project Pitching sessions.

The panel of judges were composed of UP Electrical and Electronics Engineering Institute Prof. Engr. Percival Magpantay, Ateneo de Manila University Prof. Engr. Carlos Matti Oppus, and C&E Publishing Business and Market Research Head Mr. Rodel Cruz.

A basic Kit-of-Parts (KOP) composed of Arduino Starter Kit, Set of Sensors and Training Kit sponsored by C&E Publishing, Inc. were given to each of the school finalists. The training on Arduino programming and application, sensor application and wireless communication was held at Century Park Hotel, Manila on September 9-13, 2019.

Table 24: School Team Finalists and Winners	
SCHOOL	PROJECT
1. Adelle Grace Montessori School	Aqua-Twin (Aquatic Surface Waste Collection Drones)
2. Bayambang National High School	Project One Koll Away "OKAY": An Intelligent Arduino Based Disaster and Security Management System for School Setting
3. Far Eastern University High School – Manila	Project IKAPATI: A Centralized Smart Farming Advisory System
4. Liceo-De La Salle Senior High School	Community-based Concentrated Solar Plastic Recycler
5. Malinta National High School - Senior High School	Self-Operated Arduino-Based Flood Mitigation Project
6. Manila Science High School	Terrestrial Automated Monitoring And Risk Assessment of Woodlands (TAMARAW) System: A Mobile Automated Solution towards Safeguarding Philippine Forestlands
7. New Era University - General Santos	The SMART School Desk: Student Monitoring and Assessment Reinforcement Technology (YOUTH INNOVATION PRIZE AWARDEE)
8. New Era University - Lipa City Branch	The Health-Monitoring Photovoltaic Umbrella Cane Activated by Arduino Nano
9. New Era University - Main Campus	Project ASAP: Automated Soil Analyzing and Processing System
10. Pavia National High School - Senior High School	Echo Delta Radio Repeater with GPS Technology: Its Impact on Maritime Safety, Rescue Operation and Disaster Mitigation (YOUTH INNOVATION PRIZE AWARDEE)
11. PSHS - Central Luzon Campus	Project GRAINS: GUI-controlled Real-time Automation for IoT-based Nutrient Film Technique (NFT) Vertical Farming System
12. Ramon Magsaysay Cubao High School	Project HERMES: An Arduino-based Discourse Helping Device for Deaf and Mute Learners (YOUTH INNOVATION PRIZE AWARDEE)
13. Rizal High School	LUNA: Land Unit for Necessary Assessment
14. Science Technology Education Center Cebu	Project NEMO: Navigating, Evaluating, Monitoring, Offering Water Robot for Aquaculture Farms
15. St. Scholastica's Academy Marikina	Tax1cle: Tricycle Fare Collection System Based on GPS Using Arduino Kit (C&E MAKERCE SPECIAL AWARD)

After the training, the school finalists were given 60 days to build and present their projects. The Final Presentation was held at Crimson Hotel, Alabang, Muntinlupa City on December 2-3, 2019.

In the two-day final project presentation, the school teams of Ramon Magsaysay (Cubao) High School, Pavia National High School, and New Era University – General Santos City emerged as awardees of the Youth Innovation Prize and received Php 100,000 cash each, besting the other 12 finalists in the competition.

St. Scholastica's Academy Marikina was awarded the C&E MAKERCE Special Award from the C&E Publishing, Inc.

Students going through the Technical Training Workshop and Project Pitching





Pavia National High School presenting their working prototype in front of the (3) three Board of Judges (BOJ) namely (from left to right): Engr. Carlos Matti Oppus from Ateneo de Manila University, Engr. Percival Magpantay from UP-EEE and Mr. Rodel Cruz from C&E Publishing, Inc.

The Third imake.wemake Youth Innovation Prize winning teams with DOST Undersecretary for S&T Services Dr. Renato U. Solidum Jr. (second from left), DOST-SEI Deputy Director Albert Mariño (left) and C&E Publishing Inc. COO John Emyl Eugenio (right)



YES Awardees break record numbers anew

The science education community experienced yet another record breaking year as 1,631 Filipino students swept gold, silver, and bronze medals in prestigious Science & Technology Engineering and Mathematics (STEM) competitions in 2019.

The annual YES Awards exemplify the sterling achievements of the youth in the fields of science and mathematics. The Secretary's Medal, which signifies DOST's high regard for excellence and competitiveness, is conferred to winners of international science and math competitions that have been duly registered with SEI-DOST by national organizers.

Now on its 12th year, YES continues to show an upward trend in the total number of awardees. First launched in 2007 with only 70 student-medalists, YES Awards reached an all-time high this year, surpassing the previous year's 1,454 awardees (up by 12%). 792 out of the 1,631 awardees came from the National Capital Region (NCR) while 839 came from the other regions. The number of participating schools also increased from 333 in 2018 to 357 this year.

The country's total tally of gold, silver, and bronze medals from individual, team and group categories from over 84 global STEM competitions reached 2,387, a 3.42% increase from last year's medal tally. Out of 2,387 medals, 48% are bronze (1,115), 30% are silver (708), and 22% are gold (524).

Among 12 STEM areas listed, mathematics has the most gold, silver and bronze medals with a combined number of 1,922 or 80.52% of the total number of medals garnered, followed by robotics with 199 and science with 111.

One of this year's YES awardees, Schelana Aundee Villanueva from the Philippine Science High School, shared her knowledge in robotics to grade schoolers in a free robotic engineering demo-workshop.



1,631 YES Awardees in 2019

792 from NCR

839 from other regions

FIGURE 7:
TOTAL NUMBER OF AWARDEES IN 2019

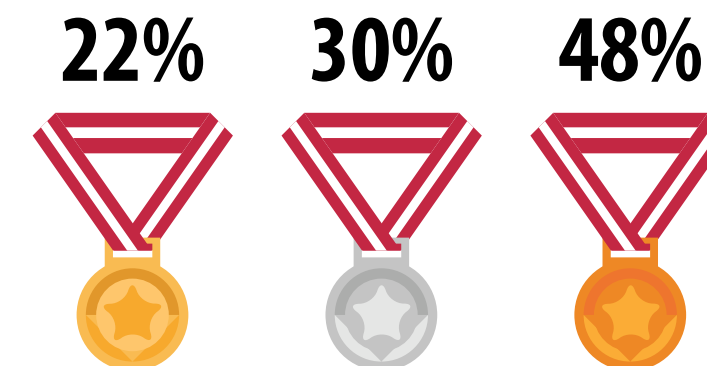


FIGURE 8:
TOTAL NUMBER OF MEDALS WON IN INTERNATIONAL STEM COMPETITIONS IN 2019

(below) Program Launch of the 4th Indie-Siyensya Filmmaking Competition on October 19, 2019 in Iloilo City during the Regional National Science and Technology Week Celebration

(lower bottom) 200 students and teachers from Panay Region participate in the science film workshop



DOST-SEI opens 4th Indie-Siyensya Filmmaking Competition

The 4th Indie-Siyensya Science Filmmaking Competition opened during the Regional Science and Technology Week (RSTW) at the Iloilo Convention Center in Iloilo City on October 21, 2019. Attended by more than 200 students and walk-in participants from different municipalities in the province, the launch ceremony encouraged individuals to submit 10-minute films related to the theme “Communities Beyond the Naked Eye”.

The launch also offered talks on science communication, entomology, and filmmaking techniques delivered by some of the members of the Board of Judges, namely: Dr. Ruby Cristobal of DOST-SEI, Dr. Aimee Lynn Dupo of UPLB-Graduate School and Institute of Biological Sciences, and Prof. Seymour Sanchez of College of Saint Benilde.

The competition is open to all interested Filipino participants. Details of the competition were disseminated in SEI Website, Indie-Siyensya Facebook fan page, while posters about the competition were disseminated in the Regions.

Indie-Siyensya Winning Films listed for Special Screening in the 2019 Science Film Festival

Winning films from the 2nd and 3rd Indie-Siyensya were also listed for special screening in the 2019 Science Film Festival, an international film festival organized by the Goethe-Institut. The Science Film Festival has been supported by the DOST-SEI for ten years now. Hundreds of students, teachers, and other guests attended the 2019 SFF Opening Ceremony held on November 5, 2019 at the SM Megamall in Mandaluyong City.

Science films from all over the world were also screened during the NSTW and RSTW festivities and during the Science Explorer road trips. Copies of the films were distributed to Philippine Science High School (PSHS) campuses, selected public schools, and DOST Regional Offices

for scheduled screenings during the Festival Season.

Fourteen DOST regional offices and PSHS campuses joined the Philippine screening with a total reach of 31,744 viewers across the country.

Climate Science Youth Camp highlights the role of water in the climate system

Aiming to contribute to the global response to the threat of climate change, the DOST-SEI implemented the 2019 Climate Science Youth Camp in partnership with the Marine Science Institute of the University of the Philippines – Diliman (UPMSI) and selected scientists. The year’s theme was H2O: Highlands to Ocean “Water is Life”.

Campers pose for a group shot together with Marine Science and Geology experts as they complete the Highlands to Ocean theme of 2019 Climate Science Youth Camp in Samal, Davao del Norte

Campers learn about freshwater ecology using insects as proxy for pollution index





(top to bottom)

JK Andres, a Marine Scientist from UP-Marine Science Institute, demonstrates water quality monitoring and plankton sampling using a Niskin bottle to campers

Geologists from UP- National Institute for Geological Sciences facilitate the survival skill module during the field activity in Hagimit River, Brgy. Guillon, Samal, Davao del Norte

Campers learn the different species of mangroves found in Brgy. Catagman, Samal, Davao del Norte



Since 2013, the Science Camp has focused on the various aspects of Oceanography, Meteorology, and Geology. It bridges the basics of climate science and hazards assessment and reduction with the concepts of innovation and leadership among public high school students by allowing them to explore the dynamics between the land forms, the river systems and the oceans, and infer the effects of climate change on the earth systems.

The camp was successfully conducted on April 22 to May 04, 2019 in the Island Garden City of Samal, Davao del Norte. It was attended by 40 students and 20 teachers from selected schools in the provinces of Lanao del Norte, Davao del Norte, Davao del Sur, South Cotabato and Agusan del Norte.

Participants were introduced to earth and ocean sciences as well as to the various S&T fields of study through specific environmental issues prevailing in their communities. They also learned actual scientific processes and approaches that would help them develop solutions to real-world problems by exercising creative and critical thinking and leadership. The lectures and hands-on activities centered on hydrological cycle, climate change, factors affecting the water cycle, watersheds, prevention, mitigation and adaptation, community-based research and science communication.

4%
DOST Central Offices (3)

21%
DOST Regional Offices (15)

4%
Scientific and Technological Services Institute (3)

37%
Research and Development Institute (26)

34%
Academe (24)
(Research Institutions based in Universities)

One-third of the CIP grantees are deployed in Research and Development Institutions (37%) and in the Academe, that is, Research Institutions based in Universities (34%), while less than one fourth (21%) in the DOST Regional Offices.

n=71

FIGURE 9:
Percentage Distribution of CIP Grantees by Type of Host Institutions

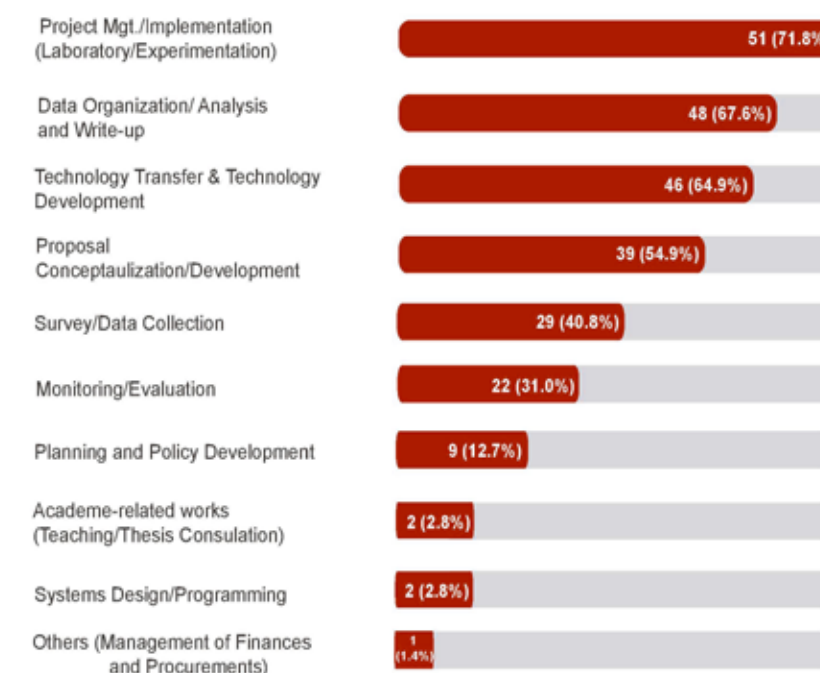
DOST-SEI evaluates impact of Career Incentive Program

DOST-SEI conducted a study that evaluated the impact of the Career Incentive Program (CIP) on its grantees and host institutions.

Since its re-implementation in 2015, over 71 grantees have already benefited from this program that aims to provide DOST-SEI scholar graduates with employment opportunities in research activities where they can contribute their knowledge and expertise.

The report highlights the profile of the CIP Grantees and Host Institutions, occupation information, significant contributions, including some relevant feedback, and recommendations from the respondents.

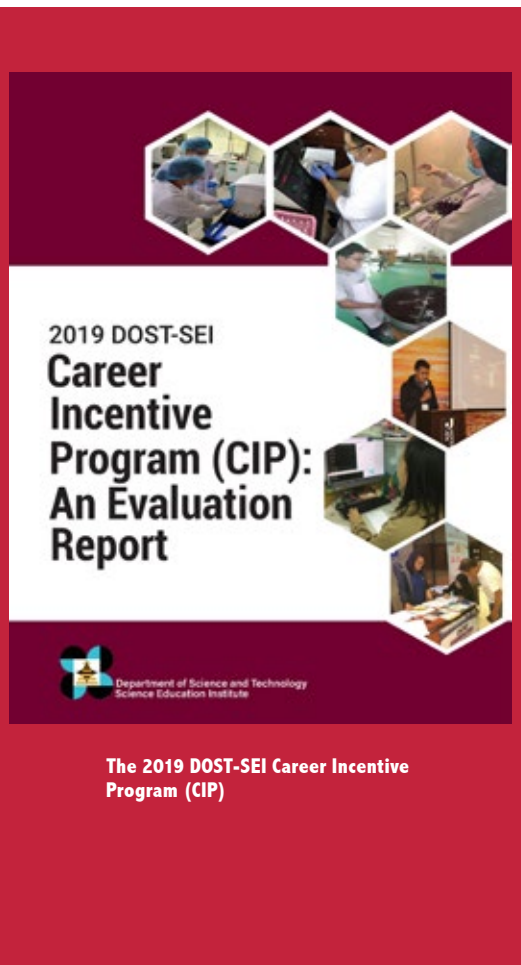
The overall results of the evaluation are highly favorable. The report provided not only valuable information on the relevance of the program to the CIP grantees and host institutions, but also highlighted the contributions of CIP grantees in R&D and innovation. Some of these findings are featured in Figures 9-12.



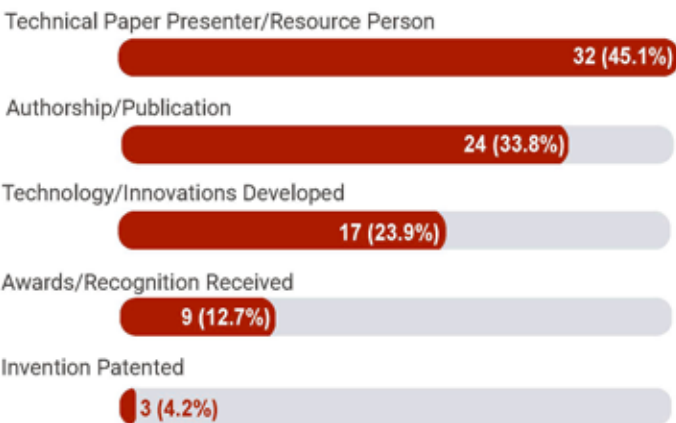
Majority of the CIP Grantees are involved in project management/ implementing including laboratory work and experimentations (71.8%).

n=71
(Multiple Answers)

FIGURE 10:
Percentage Distribution of CIP Grantees by Type of Work in the Host Institutions

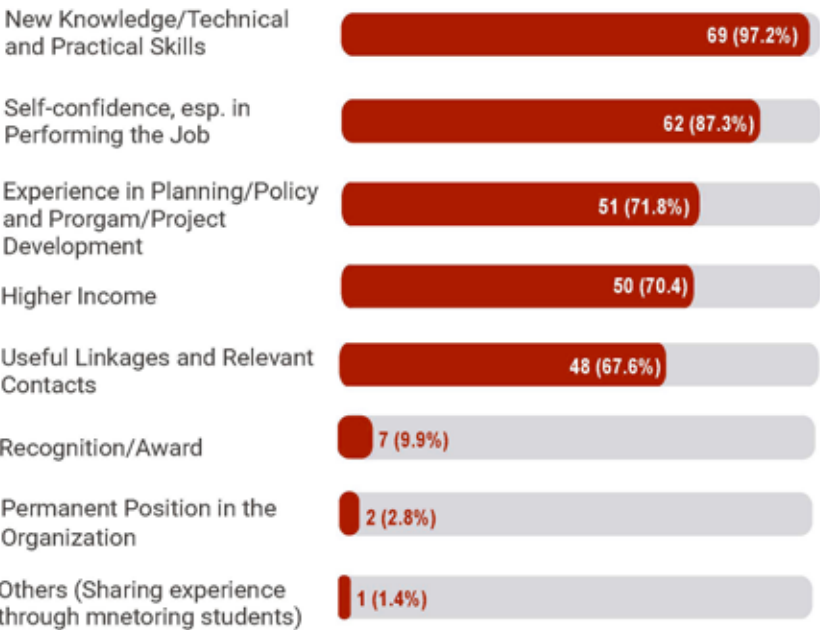


The 2019 DOST-SEI Career Incentive Program (CIP)



About half of the CIP Grantees reported that their significant accomplishments are as paper presenters/resource persons in trainings, while a third reported to have authored and published articles in journals and other publications.

FIGURE 11:
Percentage Distribution of CIP Grantees According to Significant Accomplishments



Almost all of the CIP Grantees have gained new knowledge/technical and practical skills while working in the host institutions.

FIGURE 12:
Responses of CIP Grantees on the Benefits Gained from the Program

STRATCOM INITIATIVES

DOST-SEI grows social media audience

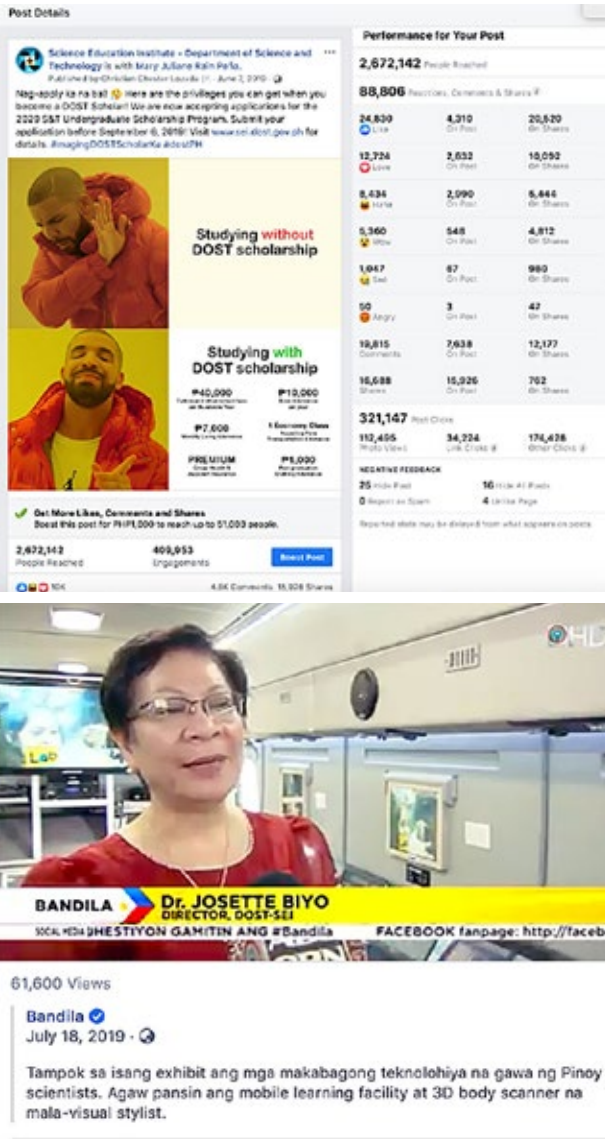
DOST-SEI's official Facebook page hit the '100,000 likes' mark in 2019 – a huge increase from its 44,500 page likes in 2018. It's most popular post, a meme on DOST scholarship benefits, reached more than 2,600,000 people and generated over 400,000 engagements.

The Institute was also more visible in tri-media as it generated 366 placements on television, radio, and print, up by 53% from 240 media placements in 2018. Seventy-four percent (74%) or 270 of the 366 placements were from DOST-SEI press releases or materialized through DOST-SEI's efforts.

Major networks featured DOST-SEI programs and projects such as Climate Science Youth Camp (GMA Regional TV), Undergraduate Scholarships (Failon Ngayon, ABS-CBN), nuLab (Bandila, ABS-CBN and State of the Nation, GMA 7), and Tagisang Robotics (Bandila, ABS-CBN and PTV News, PTV 4).

The news releases on the launch of the nuLab Mobile Science Learning Facility, the comeback of Tagisang Robotics, and the big win of the Philippine Team in the prestigious International Mathematical Olympiad (IMO) were the top three DOST-SEI stories syndicated.

GO FOR GOLD. DOST-SEI Deputy Director Albert Mariño encourages national organizers to seek support from DOST and motivates Olympiad winners to go for gold in future competitions



DOST-SEI's version of the 'Drake Hotline Bling Meme' emerged as its most engaging Facebook post for 2019

Dr. Josette Biyo gives ABS-CBN's Bandila a tour inside the nuLab science bus during its launch at the 2019 National Science and Technology Week



Presscon features youth STEM competitions and organizers

To acknowledge the efforts of national competition organizers and generate support from the media in promoting the Philippines' participation in international science and math competitions, DOST-SEI organized a Press Conference last September 18, 2019 at the B Hotel in Quezon City. DOST Secretary Fortunato de la Peña led the press conference and awarded certificates of recognition to the following national organizers:

- Mathematical Society of the Philippines (MSP)
- Kapisanang Kimika ng Pilipinas, Inc. (KKP)
- Philippine Association of Chemistry Teachers, Inc. (PACT)
- Integrated Chemists of the Philippines (ICP)

- Philippine Federations of Chemistry Societies, Inc. (PFCS)
- National Institute of Physics (NIP-UPD)
- Samahang Pisika ng Pilipinas (SPP)
- Department of Biology, School of Science and Engineering, Ateneo de Manila University (AdMU)
- Ateneo Biological Organization (BOx)

DOST-SEI highlights sustainable future through STEM education in the 2019 NSTW/RSTW

The Institute showcased its programs for the youth as it participated in the 2019 National Science and Technology Week (NSTW) and in Regional Science and Technology Week (RSTW) celebrations nationwide. The NSTW, held on July 17-21, 2019 at the World Trade Center in Pasay City, featured the theme "Sustainable Development Goals."

Together with other DOST agencies in the Science and Technology Human Resources Development Cluster, DOST-SEI held its science, technology, and innovation exhibits and events under the subtheme "STEM Education for a Sustainable Future".

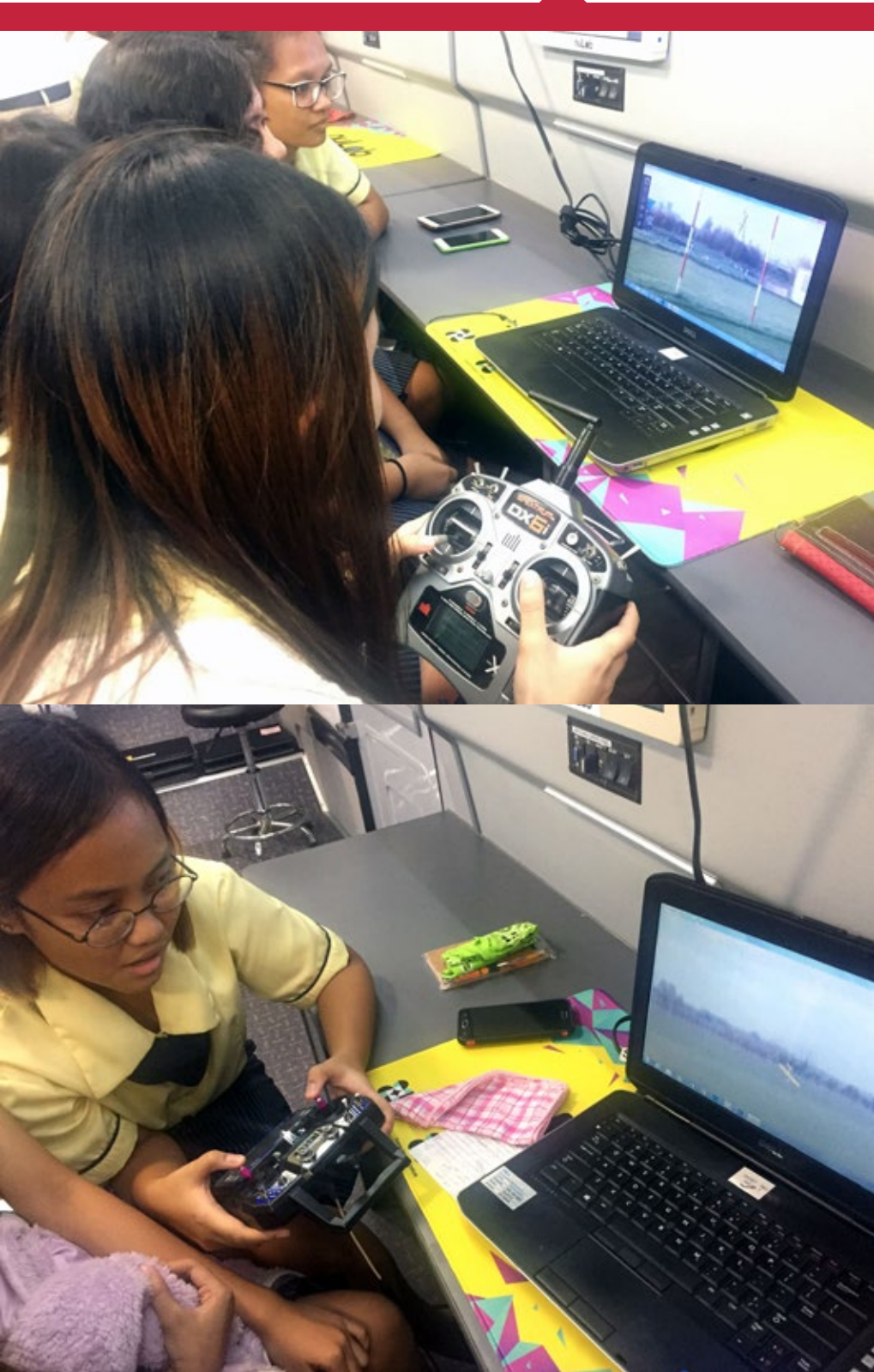
THE DOST-SEI launched its brand new science bus unit to complement the existing Science Explorer Bus – the nuLab. The launch featured some of the modules developed and facilitated by scientists which earned the appreciation of the students who were able to experience the highly interactive lessons developed to bring out the scientists in them. Officials from the DOST and DepEd toured the bus and explored its facilities.

Apart from the launching of the nuLab, other landmark activities were held, including the Inking of Partnerships in STEM Promotions between SEI and C&E Publishing, Inc., and the Signing of the Deed of Donation for ICT Equipment with Emerson Electric Asia, Ltd. The Institute also held a demonstration of innovations in STEM, Indie-Siyensya Film Showing, and the Women In STEM Forum. The DOST-SEI Scholarship Center was also set up as part of the exhibit to serve as a scholarship inquiry and consultation center during the one-week event.

The female participants together with Dr. Rogel Mari Sese, Dr. Ruby Cristobal and GAD Secretariat Ms. Jasmin Intia pose for a photo inside the NuLab bus



Female students attempt to fly a plane using a simulation application installed in the laptops provided in the nuLab



Testimonials

“ My name is Louissa Jereza, and I am currently taking up STEM strand in Iloilo City National High School. Last year, my classmates and I went to the NuLab and we had learned about the importance of watersheds and rivers with a Hydrogeologist. It was really fun since we got a chance to talk with a real scientist. They taught us about how they work in the field and how to check the water quality based on various parameters. From that moment I figured out that I am really into science. I believe that NuLab could help a lot of aspiring youth. To pursue their passion for Science since they provide an interesting and educational platform that is extremely helpful to the youth. ”

LOUISSA JEREZA
Student
Iloilo - Region IV

“ It has always been my dream to meet at least one of the Filipino Astrophysicists. That includes one of the Asian Scientist 100 Awardee, Dr. Rogel Mari Sese. Luckily, I was chosen to be part of the inaugural session of the Aerospace Engineering Module of the NuLab Bus of DOST-SEI at the National Science and Technology Week year 2019. We had a chance to see different kinds of drones and understand how they fly. It was truly a one of a kind experience. That moment helped me realize what I really want to be. At present, I am an incoming Engineering freshman; hoping and praying to be part of the next NuLab team 5 or 6 years after. ”

PRINCESS FAUSTINO CONTRERAS
Student
Caloocan - NCR

“ I am an incoming 11th grade student at the Philippine Science High School-Main Campus (PSHS-MC). When I was barely nine years old, Robotics was introduced to me. And my fascination for it simply flourished.

The world of Robotics may be male dominated. But, as intimidating as this is, I became even more determined to try and make it in this field of discipline. Over the years, I have received numerous awards in Robotics, from local and international competitions combined. To keep myself on my toes, part of my preparations for international Robotics competitions is by joining different local competitions which allow me to explore, experiment, test, and apply what I know and use what I can build.

Compared to many Research, Science and Math competitions, Robotics seems to be the hardest to win consistently. Winning once is difficult but to win any of the top three awards for five consecutive years is even harder. That's because the development and application of technology in Robotics are extremely fast paced. New discoveries and advancements happen every day. I have to adapt to these changes by constantly improving my robot design and coding or programming. In a robotics competition, a lot of things can go wrong causing you to lose the game and match. As for me, I do not lose, I learn. To me, missing out on an opportunity to try something new, something no one has tried before, is the real loss. If I lose because I decided to try something new, I am not really losing. The experience allows me to reset, rethink, readjust or change what needs to be changed, improve what needs to be improved and then try again in next possible competition.

For me, the DOST-SEI YES Awards medal of distinction is indeed the highest recognition which can be bestowed to a DOST scholar from the Philippine Science High School (Main Campus), such as myself. And receiving such a prestigious award year after year since 2017 simply motivates me to do even better than my last performance.

I consider my early exposure to and training in Robotics and Electronics as preparation for a career path in Applied Mechatronics, Aerospace or Avionics Engineering I wish to pursue. A future involvement in Technological Innovation and specialized solution-based organization are among some of the things I also look forward to doing.

To all the young minds out there, I'd like to say, *keep on learning. And remember, live to inspire, and make a difference.* ”

SCHEALANA AUNDEE RIVERO VILLANUEVA
Student

“ The GeoMarine Science Camp was one of the few opportunities where I got to experience learning outside a classroom. The activities were designed to spark innovative thinking, help us discover paths in the sciences, and make meaningful connections with fellow students. It gave me exposure to the fields in the sciences that are outside the career norms. It gave me the courage to believe that I can contribute to areas of research to understand more about our environment and studies that can even help us better prepare for unprecedented times. I have always wanted to be a scientist and the facilitators I met from UP-NIGS and UP-MSI inspired me just go for it! I ended up studying Geoscience and Physics and worked on research in Paleotempestology during my undergrad years.

I look forward to inspiring many more students like me who are passionate about science but lack the resources to go into the field and learn more about it. Since then, I have also developed an interest in Computer Science. I believe that although the field of Geoscience use science and tech to collect, analyze, and synthesize data to produce results, I know that there needs to be a continuous upgrade and integration of technology to advance the field. I look forward to seeing that happen. ”

CHARMILLE COLEEN DIZON
Past Camper
2014 Innovation and Climate Science Camp
Hyundai New Thinkers Camp
Current Affiliation: Data Insights Associate at Indigo Ag



“ Our country's dream to bring home that elusive gold from the International Mathematical Olympiad (IMO) finally became a reality at the 57th IMO held on July 2016 in Hong Kong.

The partnership between the MSP and the DOST-SEI aims to identify and develop young mathematical talents into world class ones. The Philippine Mathematical Olympiad (PMO) is a nationwide competition in mathematics for high school students. It was decided that the PMO was going to be an important part of the IMO team selection process. The DOST-SEI's commitment to provide full and continuing support resulted in our country's consistently improving performance at the IMO, which eventually brought us not one, but two gold medals in 2016. Our country has risen to rank 17th among 117 participating countries, surpassing first world and usual top-performing countries like Germany, France, Bulgaria, and Romania in that particular year. From around bottom 10 rank in 2007, the Philippines has seen itself rise to the top ranks and made itself earn the respect of many other participating countries.

Today, many of the young mathematical talents that have participated in these MSP projects are now leading and well-known experts in their chosen fields as mathematicians, physicists, computer scientists, statisticians, and data scientists. And many more are still honing their talents along this direction. The MSP gratefully acknowledges the DOST-SEI's full support in the success of its projects aimed at developing young mathematical talents. Consistent with its aim to promote and develop mathematics in the country, the MSP will continue to help develop our young talents to their fullest potential. Thanks, and more power to DOST-SEI! ”

DR. EMMANUEL A. CABRAL
President
Mathematical Society of the Philippines (MSP)



ManagingResources

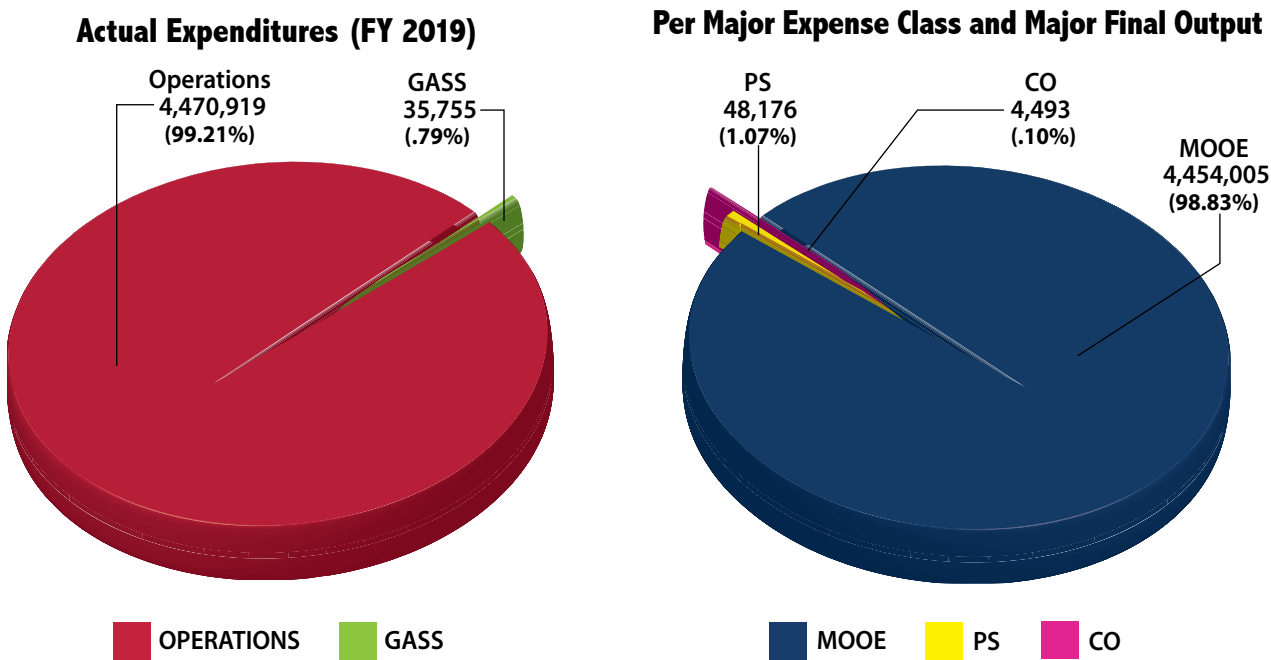
STATEMENT OF ALLOTMENT & OBLIGATIONS

(Amount In Thousand Pesos)

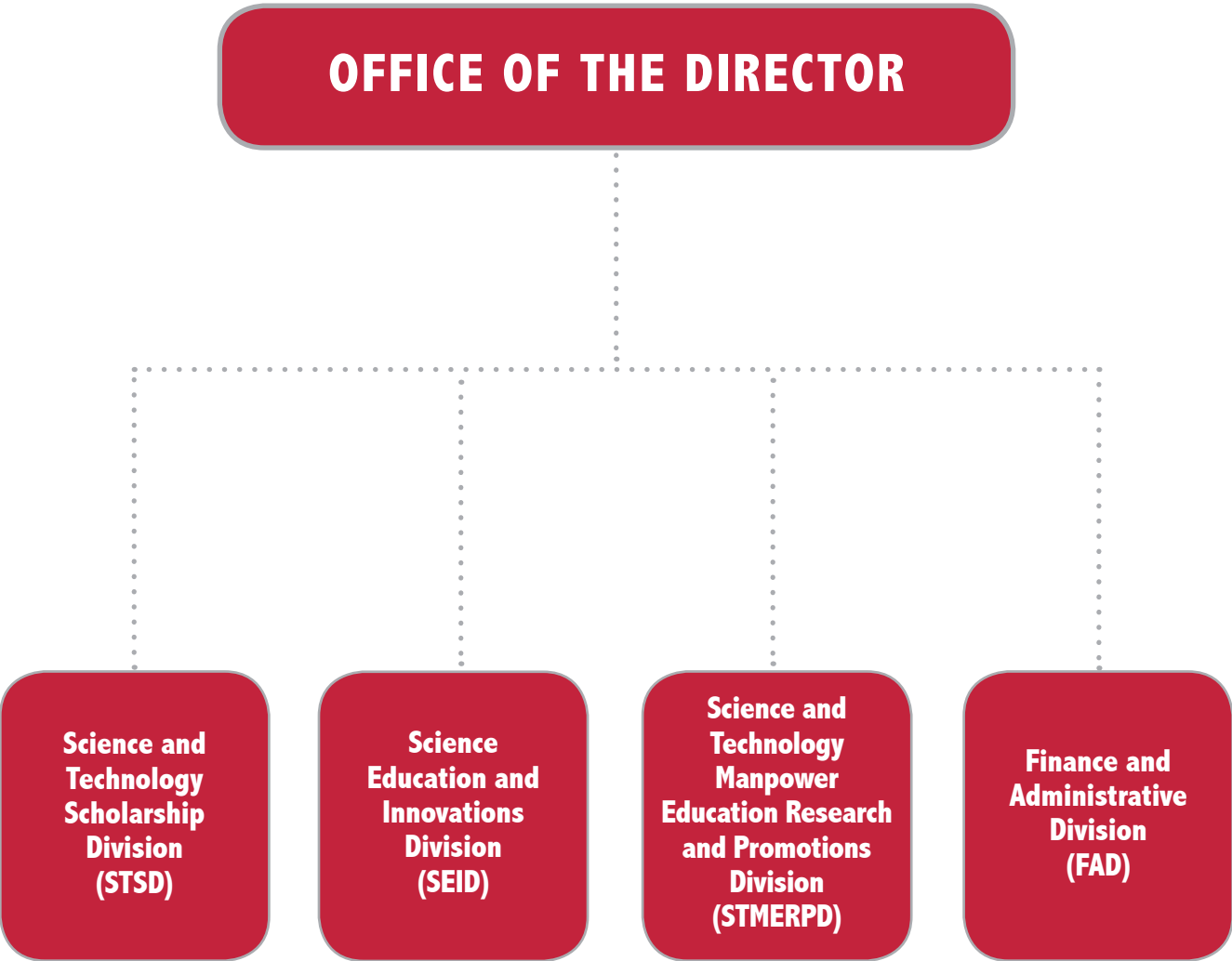
PAPS	PS		MOOE		CO		TOTAL		% Utiliza- tion
	Allotment	Obligation	Allotment	Obligation	Allotment	Obligation	Allotment	Obligation	
General Administration and Support Services	25,414	25,406	5,856	5,856	5,790	4,493	37,060	35,755	96.48%
OPERATIONS									
Development and Administration of S&T Scholarship Programs, Awards and Grants for GRADUATE Level	2,095	2,015	2,533,946	2,533,945	-	-	2,536,041	2,535,960	100%
Development and Administration of S&T Scholarship Programs, Awards and Grants for UNDERGRADUATE Level	4,838	4,818	1,886,589	1,886,590	-	-	1,891,427	1,891,408	100%
S&T Education Development Program Research, Promotioin and Development of S&T Education and Training	16,004	15,937	26,649	26,649	-	-	42,653	42,586	99.84%
Support to the Presidential Committee Implementing PD 997	-	-	980	965	-	-	980	965	98.47%
Total Budget	48,351	48,176	4,454,020	4,454,005	5,790	4,493	4,508,161	4,506,674	99.58%

BUDGET DISTRIBUTION

(Amount In Thousand Pesos)



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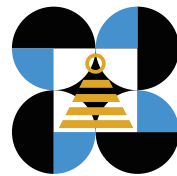
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- Undertake science education and training;
- Administer scholarships, awards and grants;
- Undertake science and technology manpower development; and
- Formulate plans and establish programs and projects for the promotion and development of science and technology education and training in coordination with DepEd, CHED and other institutions of learning.

VISION

DOST-SEI shall develop the country's human resource capacity in science and technology required to produce demand-driven outputs that meet global standards.

MISSION

DOST-SEI's mission is to accelerate the development of S&T human resources of the country by administering undergraduate and graduate scholarships and advanced specialized trainings; promote S&T culture and develop innovative science education programs.



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Science Education Institute

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