Greater Drive, Sharper Focus

2011 ANNUAL REPORT

Science Education Institute

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INTRODUCTION

Rising to the Challenge of an Expanded Mandate

THE SCIENCE EDUCATION INSTITUTE of the Department of Science and Technology (DOST-SEI) has always tried its best to face up to the challenges of developing and nurturing potential talents in science and technology (S&T) among the youth. For nearly two and a half decades, various constraints notwithstanding, the Institute has managed to improve its policies particularly in relation to the implementation of its various undergraduate and graduate scholarship programs to the production of human resources. The unwavering goal is to meet the country's urgent need to develop its S&T capability for economic development.

The year 2011 saw the Institute faced with another welcome challenge – an expanded mandate to administer scholarship programs in the undergraduate and graduate levels along the priority S&T fields and in coordination with the sectoral councils and institutions of higher learning.

With this development, it is necessary that DOST-SEI be even more strategic and creative, in planning and managing the scholarship programs. Expectedly this should result in a better rationalization of capital, a more efficient and objective division of the resources pie, to ensure that these are channeled into investments that will produce maximum output.

While there is an expansion of the Institute's role, it has clearly sharpened its focus as well. This will certainly allow DOST-SEI to align its directions with and relevant to national priority areas.

Visions for the Future

DOST-SEI aims to realize its vision of producing enough human resource capacity in S&T required for demand-driven outputs that meet global standards. The Institute is optimistic that it will be able to harness more talents among the Filipino youth and accelerate the end results of its program thrusts – namely, enhanced competencies of Research & Development (R&D) personnel, increased human capacity for priority projects, and an established feeder system for S&T through appropriate youth science programs.

As the 21st century marches on, there is no doubt that the progress of any nation rests upon how broadly and deeply its society is able to use science, technology and innovations for growth and development. Wealth and knowledge creation rest primarily in S&T, as scientific development will continue to have a significant influence on areas that have great importance for humanity, quality of life, and our sustainable existence on the planet.

Producing new graduates in S&T is therefore the key to unlocking this kind of future for our country, since they are in the best position to bring the benefits of science to the greater good of all. They can show that all citizens, irrespective of gender, ethnicity, social or geographic grouping, can learn how scientific advances can be used, known, and owned. Such equitable distribution of scientific knowledge has long characterized rich countries, where the majority of people are able to take active part in its creation and dissemination, and where ignorance is prohibited from depriving them of the ability to learn for themselves what they need to resolve their problems.

More initiatives needed

If the country is to benefit from S&T as a means to spur national development, more initiatives are needed to promote the scientific and technological fields. Senator Edgardo J. Angara, Chair of the Senate Committee on Science and Technology, recently made this call to the Aquino administration as he cited results from a survey conducted by the global firm General Electric (GE), showing that 92 percent of the respondents believe that innovation is the main level to create a more competitive economy. The survey, done during the 2nd GE Global Innovation Barometer, included around 3,000 business executives spread across 22 countries.

"This study is but another in the large body of evidence that proves investments in innovation are crucial to a nation's prosperity," said Angara. "More must be done today to meaningfully harness Filipino creativity in finding solutions to our nation's most pressing challenges like climate change, disaster preparedness, food security, healthcare, universal education and widespread poverty."

The challenge to produce the human resource needed remains daunting considering that the Philippines only has 165 S&T professionals (R&D Survey, 2007), such as scientists and researchers, for every 1 million Filipinos. This figure is even below half of the ideal ratio of 380 S&T professionals for every million population prescribed by the United Nations Educational, Scientific and Cultural Organization (UNESCO).

The turnover of S&T professionals due to permanent and temporary migration is also being determined. Based on DOST-SEI study in 2009, around 25,000 S&T professionals migrated to the United States, Canada, and other countries. As such, increasing our S&T human resources becomes all the more imperative.

We believe that school science can make a significant contribution to increasing the number of S&T professionals in the country by presenting a view of how everyone – students, teachers, and the general public – can access ways to learn science and ways to learn through science. With DOST-SEI's expanded mandate is the resolve to increase its efforts in science education to ensure the development of scientific and technological culture especially among the youth. This will ultimately result in a Philippine society where science and technology work for the benefit of all.

MESSAGE FROM THE *Secretary*

We look back at 2011 as a springboard year, wherein we were able to inculcate stronger concepts of productivity and efficiency in S&T education and promotion–concepts that will lead us further towards achieving the administration's goal of "inclusive growth" among our fellow Filipinos.

In utilizing technology towards the future, our policies must be grounded in sound science, one that is oriented to improve linkage with industry and fast track the creation of more innovation centers that will ensure the rollout of benefits for our society. The science and business community must plan the future together, while we in government must demonstrate clear intent of our commitment to inspire scientists and engineers of tomorrow and reshape our economy into one that rewards knowledge and creation.

Our partner agency Science Education Institute has the challenging task of building up a critical mass of highly trained S&T human resource through scholarships, trainings, promotions and educational advancement initiatives. It truly complements our DOST mandate, which is to accelerate the pace of knowledge-driven development in accordance with its growth potential in the country.

The challenges to our mandates are long-standing and deeply-entrenched, but we are blazing new trails with renewed dedication to meet these challenges guided by our five-point development agenda. We aim to provide breakthroughs and achievements in S&T for the benefit of the Filipino people, particularly the local entrepreneurs. We shall further explore the role of Public Private Partnership and the development of new technologies through research and development programs that will solve our national concerns, particularly on health, agriculture, environment, disaster response and risk reduction, and other sectors.

Our desire to find ways and means to make new technologies accessible to the people in the rural areas, is also the essence of our countryside development thrust, since we need to convince more people about S&T and its benefits toward improving their lives. We must help also improve the competitiveness of homegrown industries like business process outsourcing, electronics, mining and renewable energy. Moreso, we must develop our huge potential for advancement in emerging technologies like advanced manufacturing, biotechnology, nanotechnology, genomics and advanced food production technology. In the process, through our creative initiatives that promote interconnectedness and distribution networks, we help pave the way towards efficient delivery of government and social services ad for better public service.

With our strong pro-industry and pro-people stance, we must affirm our motto – *local technology works!* Technology-based entrepreneurship is the path that will transform research into serviceable innovations, build links with the business community, create sustainable means of income for our own scientists, and ultimately become a critical part of our country's future economic growth.

MARIO G. MONTEJO
Secretary
Department of Science and Technology

MESSAGE FROM THE *Director*

At the Science Education Institute, we feel a new sense of optimism and renewed vigor as we close this year in review and greet the opportunities in the coming years. A huge part of this positive outlook lies in the expansion of our mandate, a development that is expected to lead to the streamlining of our scholarship processes.

This development indicates the administration's seriousness of intention to come up with initiatives that promote science and innovation as a means to spur national development. As we fulfill our mandate to develop a pool of experts in S&T, our efforts are lit from behind by a deeper awareness that everything must redound to what President Aquino has termed inclusive growth and long term solutions for an equitable society.

SEI's part is critical in making this happen by implementing various strategies in developing human resources in S&T to fuel our engine of economic growth. Through our scholarship programs, which include advanced science and engineering fields, we are more confident about a technology-driven future for the Philippine economy.

As we directly encourage the youth to get into S&T careers, we have established programs that serve as part of the feeder system to our scholarship programs. By motivating elementary and high school students to engage in science and mathematics competitions, science camps, youth science summit, and other science oriented activities, we are able to stimulate their interests and tap their inner potentials as future scientists and engineers.

Innovations in science education are seen to make a difference in the teaching and learning of science and mathematics in the schools. These are made possible through the identification of key factors that impede the implementation of the prescribed curricula, the application of appropriate measures and technology to address such factors, and the establishment of mechanisms to ensure that institutions are able to adapt to certain changes that are necessary to improve science education among schools.

We definitely have much to do, but under the guidance of our policymakers and with the confidence of the publics that we serve, we will meet these challenges head on.

FILMA G. BRAWNER
Director
Science Education Institute

HIGHLIGHTS

Developing the S&T Human Capital

The various scholarship programs administered by DOST-SEI continued to draw the interest of graduating high school students. In 2011, the **Republic Act 7687 (S&T Scholarship Act of 1994)** managed to support a total of 9,099 scholars in the undergraduate level, including 1,482 that graduated in the course of the year.

A total of 25,672 graduating high school students took the **2012 DOST-SEI Undergraduate Scholarship Examination**, a turnout higher by 17.75 percent over 2011's number of examinees. The number of examinees from the Autonomous Region of Muslim Mindanao (ARMM) increased by 69.16 percent over the previous year.

Efforts to enact a law **that would amend RA 7687** included DOST-SEI's close collaboration with the Committee on Science and Technology of the Senate and the House of Representatives. The proposed amendment seeks to expand the coverage of S&T undergraduate scholarships, provide additional funding, and accelerate the development of S&T human resources.

Studies in S&T manpower took a step forward when DOST-SEI initiated a project that would **estimate the magnitude of human resources in science and technology** in the country. The objective is to provide a better guide for policymakers on crafting legislations concerning improvement and maintenance of human capital in S&T.

Innovations in Teaching and Learning

The **Project MOVE UPS** reached its third and final year of implementation in 2011 with a number of significant activities such as a Science Camp, Teacher Training session, and recognition ceremony for those who passed the PSHS National Competitive Examinations.

A conference on **Writing and Multimodal Representation** was organized to introduce Filipino teachers to an innovative tool that promotes improved learning of science. The event featured various resource persons from different countries, all involved with the writing-to-learn approach to education.

The **Integrated Training in Digital Applications and Teaching Electronics** held its second training conference to underscore the growing importance of inculcating a framework of knowledge and experience in the field of electronics.

DOST-SEI, together with the Advanced Science and Technology Institute (ASTI) fast-tracked a priority project entitled **"Pilot-testing of Courseware and Tablet PC."** This project involved the two-month development of 10 Grade 1 modules in Mathematics that would serve as the initial content of the Tablet PC for pilot testing to selected public elementary schools for the 2012 school year.

The Institute supported the design and development of **Statistical Software Package** that would help educators and students doing their research, theses or dissertations, in analyzing their data.

Promoting S&T Culture

The **14th Philippine Mathematical Olympiad** put the spotlight once again on students who excel in mathematics, particularly those who won the National Stage of the competition and became delegates to the **International Mathematical Olympiad**. In this prestigious global competition, three members of the Philippine team brought home a bronze medal each.

Likewise, in the **Australian Mathematics Competition**, several Filipino students won medals and other prizes after competing against students from 10 other participating countries.

The Philippines hosted for the first time the **8th International Mathematics and Science Olympiad (IMSO) for Primary Schools** with over 600 students, coaches, math educators, parents and guests from 11 other countries. The local team garnered 28 medals in mathematics and 28 more in science.

The **Tagisang Robotics: Design, Build, Play** successfully held its pilot competition at One Esplanade of the SM Mall of Asia with 22 participating teams from public S&T-oriented and private high schools. The event was witnessed by over 400 students, teachers and robotics enthusiasts of all ages.

The **Science Explorer** visited various locations in Ilocos Norte, Benguet, Mountain Province, Pangasinan, Rizal and Metro Manila reaching on to 2,402 students from 152 schools.

Students interested in marine science and their advisers had a taste of what it is like to explore the oceans as they attended the **2011 Marine Science Camp** held in Bolinao, Pangasinan in cooperation with the Marine Science Institute (MSI) of the University of the Philippines in Diliman.

DEVELOPING HUMAN RESOURCES IN SCIENCE AND TECHNOLOGY

A UNESCO STATEMENT on the importance of science education for all sums up DOST-SEI's own manifesto on its scholarship activities: "Indeed, science and mathematics education that is relevant and of quality can develop critical and creative thinking, help learners to understand and participate in public policy discussions, encourage behavioral changes that can put the world on a more sustainable path and stimulate socio-economic development."

Such a sweeping influence of science education is hard to ignore as the world gets increasingly shaped by science and technology. The future will always be requiring more scientists capable of developing effective and feasible responses to environmental changes; to social challenges like poverty reduction and job generation; to health improvement needs and many other issues with which humanity will always be faced. In facing up to its own challenges in the national front, DOST-SEI can help get the country moving at the same pace as the rest of the developed world.

Number of S&T Scholars Continue to Rise

Under the **Undergraduate Level Scholarship Program**, the turnout of scholars supported by DOST-SEI continues to be a positive sign of a healthy interest in science and its related fields among the youth. In 2011, there were 6,698 scholars in the undergraduate level, plus 919 new ones that came in. Those who graduated numbered 1,482, making up a total number of 9,099 scholars the Institute managed to sustain during the year in review.

The graduate level scholarship programs likewise remain vigorous with the entry of more scholars taking up Masters and Doctoral courses, providing avenues for building up our capacity to succeed in the 21st century knowledge-based economy. DOST-SEI's **Capacity Building Program in Science Education** had 77 continuing scholars in its Masters Program, and managed to graduate 10. The Doctoral Program had a total of 93 scholars, 73 of whom were continuing, 16 were new ones and 4 having graduated.

The **Accelerated Science and Technology Human Resource Development (ASTHRD) Program** supported a total of 1,371 scholars in its Masters program. Among these, 951 were continuing with 225 newly accepted, and 195 graduated. In the Doctoral Program, 240 were continuing scholars with 46 new ones and 20 graduated, for a total of 306 scholars supported.

For the **Engineering Research and Development for Technology (ERDT)**, which offers Masters and Doctoral degrees in various engineering fields under the consortium of eight member-universities and supported by DOST-SEI, the number of scholars were on the rise as well. Taking up Masters program were 371 continuing scholars and 177 new ones, with 73 having graduated, for a total of 621 scholars. Its Doctoral program had 81 continuing scholars and 27 new ones, with 6 graduates for a total of 114 scholars in 2011.

TABLE1: Number of Scholars Supported by Scholarship Program

Scholarship Program	No. of scholars
Undergraduate Level	
Continuing	6,698
New	919
Graduating	1,482
TOTAL	9,099
Graduate level	
1. Science Education	
Masters Program	
Continuing	77
New	-
Graduating	10
TOTAL	87
Doctoral Program	
Continuing	73
New	16
Graduating	4
TOTAL	93
2. ASTHRD	
Masters Program	
Continuing	951
New	225
Graduating	195
TOTAL	1,371
Doctoral Program	
Ongoing	240
New	46
Graduating	20
TOTAL	306
3. ERDT	
Masters Program	
Continuing	371
New	177
Graduating	73
TOTAL	621
Doctoral Program	
Continuing	81
New	27
Graduating	6
TOTAL	114

Various Scholarship-Related Programs Implemented and Managed

Presentation of the 2011 S&T Scholars to the DOST Secretary. The 2011 DOST-SEI scholars, represented by those in the National Capital Region, were presented to DOST Secretary Mario G. Montejo, who called on the recipients to be the best that they can be in their chosen fields and contribute to the advancement of the country, in an affair held at the DOST Executive Lounge on 4 May 2011. Afterwards, Nestor Alcala, a two-time DOST scholar, and Supervising Undersecretary of SEI Fortunato T. dela Peña gave inspirational messages.

The attendees were then grouped according to their scholarship programs for the orientation proper and signing of the Scholarship Agreement.

DOST Secretary Mario G. Montejo calls on the new scholars to be the best that they can be in their chosen fields to help the country.

Orientation and Signing of Scholarship Agreement. The orientation of the 2011 DOST-SEI scholars was held at the DOST Executive Lounge on 4 May 2011. This activity is intended to ensure that the scholars and their parents understand the terms and conditions of the scholarship programs – the policies, privileges, support activities, academic requirements, obligations and others -- prior to accepting the scholarship award and signing the Scholarship Agreement.

Simultaneously, personnel from the Land Bank of the Philippines processed the scholars' application for e-cards, which work as both identification card and ATM for withdrawing their stipends and other financial assistance. Similar activities were done at the DOST Regional Offices for the scholarship awardees based in the regions.

Scholars with their parents signing the Scholarship Agreement

In Touch with Excellence. On 29 July 2011, the Institute conducted its annual recognition ceremony of DOST-SEI scholars who graduated with academic honors. These undergraduate scholars, numbering 1,482, graduated at the end of SY 2010-2011 in various S&T priority courses under RA 7687 and Merit scholarship programs. Of this total, 338 or twenty-three *p*ercent (23%) graduated with honors: 17 *summa cum laude*, 81 m*agna cum laude*, 225 *cum laude*, 3 honorable mention, 9 academic awards, and 3 with honors. Six (6) scholars completed their courses earlier than the prescribed period of study.

In the ASTHRD program, 215 graduated with 3 magna cum laude, 9 cum laude, and 1 completing the course earlier than the prescribed period of study. The ERDT program produced 79 graduates, with 3 graduating with honors. The Science Education Consortium produced 14 graduates ***(See Table 2)***.

AGHAM Party-list Representative and Vice Chairman of the Congressional S&T Committee Angelo B. Palmones urges scholar-graduates to excel in their respective fields.
(Topmost): Mr. Jonas M. Cura, 2009 GIFTS Scholar, BS Mathematics, PLM, graduated Summa cum laude expresses his gratitude to DOST-SEI and commits to do well in his field.

Roundtable Discussion on Prioritizing S&T Fields of Study for the DOST-SEI Undergraduate Scholarship Program. In the National Science and Technology Plan 2002-2020, S&T experts and stakeholders have identified several priority areas that shall serve as guide for the allocation of S&T resources and assistance. Bearing in mind this long-term plan, 75 participants from government agencies, industry R&D institutions, academe and DOST councils/institutions participated in a forum with the following objectives:

- to identify the S&T fields that will likely meet the needs of industry; and
- to come up with a list of S&T priority courses that will be offered under the DOST-SEI undergraduate scholarship programs for SY 2012-2013 and onwards.

The discussion is regularly conducted to continuously ascertain and align the relevance of various S&T courses to the needs of national development. Held on 18 August 2011, the forum opened with a keynote message from DOST Secretary Mario Montejo, who presented the National R&D Priority Program for 2011-2016. Plenary speakers were also composed of representatives from DOST, IBM Philippines, Commission on Higher Education (CHED), and Board of Investments.

After workshops on identifying and prioritizing courses in the Basic Sciences/Other Applied Sciences, Engineering and Science Education, the outputs were presented by the designated Chairpersons of each group at the final plenary session. The courses proposed for inclusion in existing S&T priority courses include:

- Aeronautical Engineering (for transport and logistics sector)
- Naval Architecture and Marine Engineering (for ship building design)
- Microbiology
- Pharmacy (industrial pharmacy, drug development)
- Veterinary Medicine
- Agricultural Economics
- Agribusiness Management
- Bachelor of Elementary Education with specialization in General Sciences/Integrated Science

2012 DOST-SEI Undergraduate Scholarship Examination. Continuing its efforts to attract talented and deserving high school graduates to take up courses in priority S&T fields, DOST-SEI administered on 20 November 2011 its Undergraduate Scholarship Examinations for the selection of the 2012 new undergraduate scholars. Applicants of the scholarships must belong to the top 5 percent of regular high school graduating class and members of the graduating class of a DOST-SEI-identified or DepED-recognized science high school.

A total of 25,672 graduating high school students took the examination in 128 test centers nationwide, in response to the announcements in newspapers, brochures, the SEI website, and tarpaulins placed in strategic areas all over the country. The turnout is higher by 17.75 percent compared to 2011 examination.

Table 2: Breakdown of 2011 S&T Scholar-Graduates and Those with Honors

Scholarship Program	No. of graduates	Academic award						Total no. of graduates with honors	% of graduates with honors	Completed earlier than the prescribed period
		Summa cum laude	Magna cum laude	Cum laude	Honorable mention	With academic awards	With honors			
Undergraduate scholarship program										
RA 7687	**1,339**	14	66	190	2	9	3	**284**	21	4
MERIT	**143**	3	15	35	1	-	-	**54**	38	2
TOTAL	**1,482**	17	81	225	3	9	3	**338**	23	6
Graduate scholarship programs										
ASTHRD	**215**	-	3	9	-	-	-	**12**	6	1
ERDT	**79**	1	-	-	-	-	2	**3**	4	-
SCIENCE ED.	**14**	-	-	-	-	-	-	**-**	-	-
TOTAL	**308**	1	3	9	-	-	2	**15**	5	1

The number of examinees from the Autonomous Region of Muslim Mindanao (ARMM) increased by 69.16 percent over last year. Examinees from critical areas of the region like Jolo, Sulu and Marawi City took the examination in Zamboanga City and Iligan City, where they were provided with transportation and meal allowances.

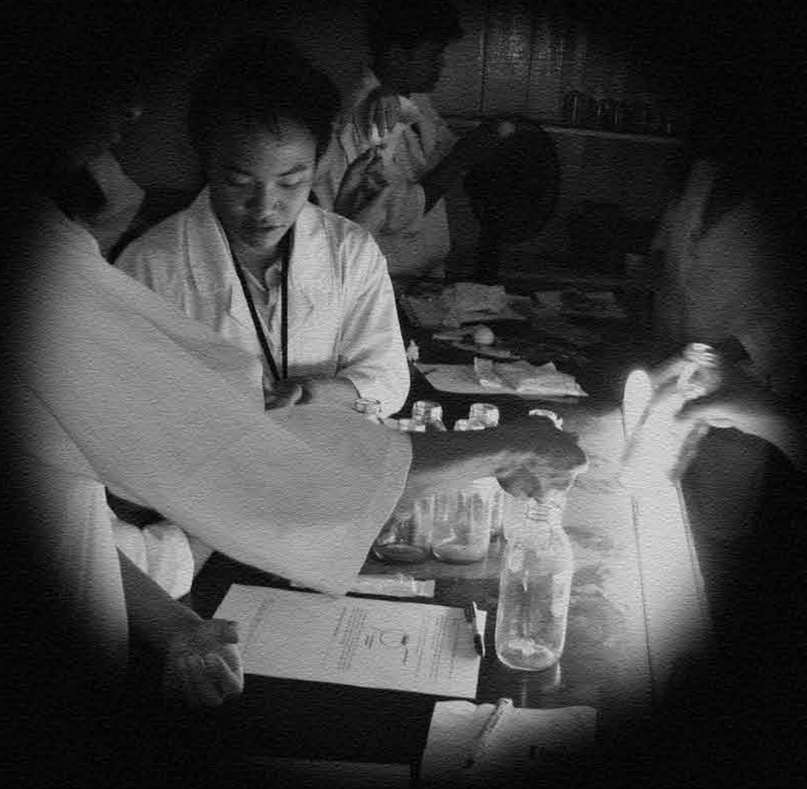
A total of 27,140 application forms were received and processed. The examiners also underwent an orientation on 15 November 2011 to ensure that the test was administered in a standard mode in all 128 test centers.

Collaboration with Congress to Enact Law for the Expansion of RA 7687. DOST-SEI closely collaborated in 2011 with the Committee on Science and Technology, both of the House of Representatives and the Philippines Senate, for the enactment of a law that would expand RA 7687. The bill, which was authored by Rep. Angelo B. Palmones, would essentially expand the coverage of S&T undergraduate scholarships being offered by the Institute, provide additional funding, and intensify the goal of accelerating S&T human resources development.

The bill takes into consideration the fact that the Philippines lags in terms of trained personnel in S&T. To increase the number of qualified scholars, the new bill proposes to consider the grades of the students, specifically in math and science, as qualifying factors. It also proposes to measure the increase in scholarship fund allocation to the rate of inflation and the prevailing cost of education.

The DOST-SEI is optimistic that the new bill will be a great help in ensuring the continued creation of a critical mass of scientists and engineers in the country.

STRENGTHENING CAPABILITIES IN SCIENCE AND TECHNOLOGY EDUCATION



THE SUCCESSFUL IMPLEMENTATION of the K-12 basic education and other initiatives to enhance the country's educational system require qualified and effective educators who will be at the forefront of the many changes taking place. At no other period in our history has the world been open to so much information and innovation, brought by rapid technological development, which is why we must intensify the development of future practitioners who will take on the responsibility of using these advancements to greater service for the Filipino people.

Young students, S&T practitioners and educators, and graduate scholars are taking advantage of the many valuable conferences, workshops and training programs that DOST-SEI conducts and facilitates every year. The Institute realizes that more resources need to be invested towards creating a self-sustaining learning and knowledge-sharing environment; more must be done to reverse the downward trend of our global competitiveness and to catalyze the reform process towards raising the bar of our teaching standards.

Specialized Trainings in Science and Mathematics

Project MOVE UPS (Year 3). DOST-SEI's approach to provide favorable learning environment In Muslim-dominated schools, dubbed **Mindanao Opportunities for Vitalized Education and Upgrading of Science (MOVE-UPS)**, came to its third and final year of implementation in 2011. Its beneficiaries were the students and teachers of 60 feeder schools from the divisions of Maguindanao I, Maguindanao II (Shariff Kabunsuan), Lanao del Norte, Lanao del Sur I-A, Lanao del Sur I-B, Lanao del Sur II-A, Lanao del Sur II-B, and Marawi City.

This project was first undertaken in 2008 with the objective of:

1. Encouraging and helping students to understand, appreciate and value the importance of science;
2. Developing more relevant approaches and strategies for more effective teaching and learning, particularly in Science, Mathematics and English subjects in the identified Muslim-dominated feeder schools; and
3. Improving student performance in science and mathematics education in Muslim dominated elementary schools.

In its final run from January to April 2011, the project conducted a Science Camp on 11-15 April 2011, with the theme "Living with Science, Gearing up for the Next Level." Hosted by the Philippine Science High School-Central Mindanao Campus, the activity was participated in by 113 pupils and 112 teachers in the elementary level. Various experts from the Philippine Atmospheric, Geophysical and Astronomical Space Administration (PAGASA), Philippine Institute of Volcanology and Seismology (PHIVOLCS), Department of Environment and Natural Resources (DENR), and Department of Science and Technology (DOST) Region XII gave lectures on various topics intended to enhance the pupils and teachers' knowledge in science and technology. The names of experts and their respective topics are as follows:

NAME/POSITION/OFFICE	TOPICS
Mr. Niño A. Relos Senior Weather Specialist Research and Development and Training Division PAGASA	Cover or Run? Getting Ready for Natural Disasters (Typhoon)
Ms. Ma. Mylene M. Villegas Chief Geologic Disaster Awareness and Preparedness Division PHIVOLCS	Cover or Run? Getting Ready for Natural Disasters (Earthquake)
Dr. Ma. Lourdes Q. Moreno Science Research Specialist II Ecosystems Research and Development Bureau DENR	Biodiversity and You: Exploring the Wonders of Nature
Dr. Zenaida P. HR Laidan Regional Director DOST Region XII	The Role of Science and Technology in Ensuring Halal Foods

Another highlight of Project MOVE-UPS' final year was the awarding of Certificates of Recognition, Medals and cash prizes of P10,000 each to three (3) pupils who successfully passed the 2011 PSHS National Competitive Examination (PSHS-NCE). They were:

1. Hezekiah Cresja M. Docdoc of Kolambugan Central Elementary School, Lanao del Norte;
2. Vince Robert P. Arboleda of Nuro Central Elementary School, Maguindanao 2;

3. Sayyed Khatami Sultan Abdulraouf of Amai Pakpak Central Elementary School, North District, Marawi City

The Project also held a Teacher Training session, which has trained a total of 237 Science and Mathematics teachers from the 60 feeder schools. Held on 7-27 April 2011 at Mindanao State University, Marawi City, the training intended to capacitate and enhance the participants' skills and knowledge in teaching science and mathematics to their pupils.

Capacity Building and Developing Global Competitiveness in Science Education. A fascinating array of activities was undertaken under this project in 2011. By exposing teachers and students from elementary, secondary and tertiary schools to local and international programs, this project aims to enhance the teaching and learning environment in order to meet the new and changing demands in science and mathematics education. The following were the activities conducted throughout the year in review:

a. **Condensed Matter Physics Laboratory (CMPL)Superconductor Summer Immersion Program.**

This program ran for eight weeks at the National Institute of Physics, UP Diliman (UP-NIP) from April to June 2011. Its intention was to give opportunities to undergraduate Physics students to work with and be trained by CMPL Supercon members within the context of actual laboratory research, allowing them to gain a real, hands-on, excellent and intense scientific research experience to enhance their intellectual and professional development.

DOST-SEI provided financial assistance to cover the transportation and workshop expenses as well as research supplies to the ten (10) participants coming from Mindanao State University Marawi, Univesity of San Carlos, Polytechnic University of the Philippines, UP Baguio, and UP Los Baños.

b. **46th Annual BIOTA Convention and Scientific Sessions**

The Biology Teachers Association of the Philippines, Inc. (BIOTA-Philippines, Inc.), in cooperation with the Institute of Biology of UP Diliman, the Department of Education, and the Commission on Higher Education (CHED), held its 46th annual National BIOTA Convention and Scientific Sessions on 7-9 April 2011.

With the theme "Trends in Biology Education and Research," the convention features scientific sessions, workshops, hands-on activities, seminars, educational tours and exhibits in order to learn new teaching innovations, strategies and other creative activities that help improve and promote Biology education in the country. DOST-SEI provided financial assistance to cover the registration fees of 20 Biology teachers who attended the sessions.

c. **ChemCamp 2011**

This annual summer enrichment program provides training to incoming senior high school students who display high aptitude in the sciences. It specifically offers a comprehensive view of the major fields of chemistry and demonstrates their relevance to human life and society; employ chemical principles in looking at ordinary things and events; promote understanding in chemistry as an experimental science and develop basic laboratory skills and data management.

The camp was implemented on 4-15 April 2011 and 25-29 April 2011 at Ateneo de Manila University (ADMU). Eighty (80) incoming senior high school students gained greater exposure to major fields of chemistry such as organic, inorganic, biochemistry, analytical and physical chemistry through the following experiments and other activities:

1. Extraction of Bioactive Compounds
2. Synthesis of Aspirin
3. Synthesis of Glyptal Resins
4. Acid-base titration, Redox reaction
5. Analysis for dissolved oxygen of water samples
6. Materials chemistry
7. Food chemistry
8. Manufacture of Cosmetic products

d. **ChemTeach 2011**

While ChemCamp is for students, ChemTeach is a complementary workshop for high school chemistry teachers aimed at providing them with new teaching methodologies, knowledge updates, and innovative hands-on experiments. Held at Ateneo Chemistry Department, Ateneo de Manila University from 2-17 May 2011, ChemTeach was participated in by 19 public and private chemistry teachers from Metro Manila. In addition to upgrading their skills in chemistry, they were able to acquire a fresh enthusiasm and perspective on how to further enrich the learning experiences of their students.

e. **Bioinformatics and Genetic Data Analyses**

Held at the UP Institute of Biology on 25-28 October 2011, this seminar workshop was conducted to provide Biology teachers with knowledge and skills on molecular genetics, bioinformatics, phylogenetic analyses, population genetics, DNA barcoding, and experimental design and data analyses. The workshop drew the participation of 19 Biology teachers who were equipped with enough information to eventually be able to process DNA sequences and analyze these using software such as Bioedit and Mega 4 Staden. SEI provided financial assistance for the implementation of this project.

f. **Hands-on Minds-on Microscale Chemistry**

This one-day workshop, held at the Estrella Alabastro Hall of DOST-SEI, introduced the microscale technique in teaching Chemistry to 20 high school Chemistry teachers from the Department of Education, Division of Taguig, Pateros and Parañaque.

Microscale Chemistry works with small quantities of chemical substances, in place of traditional chemistry teaching that centers on multi-gramme preparations. It also does away with expensive laboratory glassware and favors small-scale work using low-cost materials. It is based on the premise that many of the experiments associated with traditional Chemistry can be carried out in much simpler equipment like injection bottles, syringes and plastic pipettes. This method of teaching Chemistry is suitable in many developing countries, allowing poorly equipped schools to introduce laboratory experiences to their students and engage them in effective chemical experiments.

The following were the advantages learned by the participants in using miscroscale techniques:

- Reduction of chemical use thus promoting waste reduction
- Reduction of laboratory cost
- Shortened experiment time, thus allowing the teachers to have more time engaging students in discussions
- Savings in storage space and lowered breakage cost
- A clean and productive laboratory environment, and a sense of "Green Chemistry."

International Conference on Improving Learning of Science: Writing and Multimodal Representation. DOST-SEI provided financial assistance to this conference that was organized to introduce to Filipino teachers the use of writing as a tool to promote an improved learning of science. Specifically its aims were:

- To familiarize participating teachers with writing-to-learn strategies involving multimodal representations for the understanding of scientific concepts;
- To present a platform for the sharing of experiences in the embedding of multimodal representation in writing-to-learn tasks as an instructional tool in learning science.

Held on 11-12 April 2011 at the University of Santo Tomas, the conference drew 93 participants from different universities and colleges in all regions of the country. Adding to the illustrious occasion were the presence of resource persons from different countries, all actively engaged in science education research, particularly on the writing-to-learn approach and the use of multi-modal representation. These resource persons include:

1. Prof. Brian Hand (Science Education, University of Iowa, USA)
2. Prof. Arlyne Mickey Sarquiz, Director Emeritus; and
3. Dr. Lynn Hogue, Associate Director (both from Center for Chemistry Education, Miami University-Middletown, USA)
4. Prof. Jeonghee Nam (Chemistry Education, Pusan University, South Korea)
5. Dr. Murat Gunel (Associate Professor, Department of Science Education, Ahi-Evran University, Turkey)
6. Dr. Wen Hua Chang (Graduate Institute of Science Education, National Taiwan Normal University, Taipei, Taiwan)
7. Dr. Elisabeth Rukmini Goei (University Katolik Indonesia Atma Jaya, Jakarta, Indonesia)
8. Dr. Mageswary Karpudewan (School of Educational Studies, Universiti Sains Malaysia, Malaysia)

The two-day conference involved three (3) workshops in which the different modes of representation were introduced to the teachers using the textbooks they commonly use. The participants were then asked to generate a set of rubrics to evaluate the effectiveness of the representations.

Seven (7) lectures were also given, all touching on the current theory of learning that underpins how students learn science knowledge, and sharing the results of research done in several countries on the use of the writing-to-learn strategy in science education.

Training Program in the Mathematical Enhancements, Recreation and Innovations Toolkit (MERIT) for Teachers II. DOST-SEI collaborated with the Mathematical Society of the Philippines (MSP) to conduct this specialized training program intended to equip secondary-level Mathematics teachers with innovations and enhancements of selected topics that will be useful in their classrooms, and help them prepare their students for Mathematical competitions and investigations.

Held on 24-29 October 2011 at Punta de Fabian Resort, Manila East Road, Barangay Evangelista, Baras, Rizal, this

program was the continuation of the MERIT for Teachers program that was successfully implemented in October 2010 in Cebu City. Participants included 24 Mathematics teachers from different S&T-oriented High Schools, Regional Science High Schools, and Philippine Science High Schools in Luzon except from the National Capital Region.

Topics, which included geometric constructions, polynomial extravaganza, combinatorial explorations, and mathematical investigation, were discussed by the following lecturers:

1. Mr. Alva Benedict C. Balbuena (UP Diliman)
2. Dr. Julius M. Basilia (UP Diliman)
3. Dr. Evangeline P. Bautista (ADMU)
4. Ms. Ma. Theresa T. Fernando (ADMU)
5. Dr. Ian June L. Garces (ADMU)
6. Mr. Karl Friedrich C. Mina (ADMU)
7. Dr. Job A. Nable (ADMU)
8. Dr. Arlene A. Pascasio (DLSU)
9. Dr. Eden Delight B. Provido (ADMU)
10. Dr. Jumela F. Sarmiento (ADMU)
11. Mr. Eric P. Siy (ADMU)

2nd Integrated Training in Digital Applications and Teaching Electronics (IT-DATE 2). Taking off from the success of the first IT-DATE program, the IT-DATE 2 was conducted to provide participants with a framework of knowledge and experience by which the field of electronics will be known and appreciated. It is a platform to provide selected high schools with teacher training, courseware, equipment and other related facilities for an introductory study of digital electronics applications. It also aims to contextualize these topics within the field of Filipino innovation and entrepreneurship.

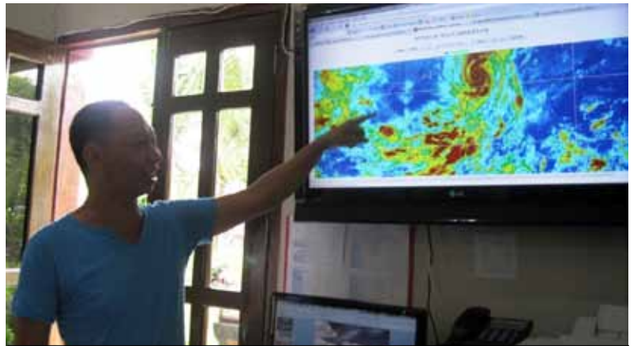
Held on 28 November to 03 December 2011 at Mirant Laboratory, Advanced Science and Technology Building of the Philippine Science High School (PSHS) Main Campus, the IT-DATE 2 drew the participation of sixteen (16) teachers from nine (9) Regional Science High Schools in Western Visayas, Central Visayas, Eastern Visayas, Zamboanga Peninsula, Northern Mindanao, Davao Region, SOCCSARGEN, CARAGA, and ARMM. The intensive week-long training combined lecture and laboratory work on topics ranging from basic and digital electronics, programming, and embedded systems on a need-to-know basis.

Strengthening the Capability of Science and Mathematics Teachers on Disaster Risk Reduction and Management (DRRM). This project was intended to increase awareness and strengthen capabilities of elementary and secondary teachers on managing and mitigating disasters in order to guide them and their students to quality, timely and effective response to natural phenomenon should one occur. It also sought to enhance scientific knowledge of teachers on natural disasters and climate change; and to communicate such knowledge to students to help them cope with disasters.

Held from January to December 2011, the project was able to train and capacitate a total of 147 DepED Master Teachers from Regions I, III, V and VIII and University faculty members. The training programs were conducted in four (4) partner universities: Mariano Marcos State University (MMSU) in Laoag, Ilocos Norte; Central Luzon State University (CLSU) in Science City of Muñoz, Nueva Ecija; Bicol University (BU) in Legaspi City; and Visayas State University (VSU) in Baybay, Leyte.

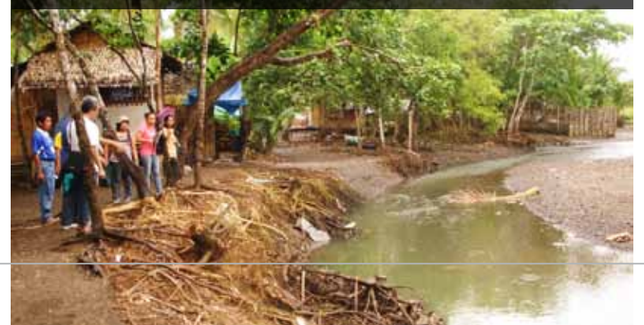
Resource persons comprised experts from PHIVOLCS, PAGASA, Mines and Geosciences Bureau (MGB), and Office of Civil Defense. As a culminating activity, a technical tour was also conducted to expose the participants to the various pieces of equipment introduced during the training and how they function in forecasting and monitoring natural disasters.

Training Venue	Training Dates	Technical Tour
Visayas State University, Baybay, Leyte	25-29 Apr 2011	30 Apr 2011
Central Luzon State University, Science City of Muñoz, Nueva Ecija	9-13 May 2011	16 May 2011
Mariano Marcos State University, Laoag City, Ilocos Sur	9-13 May 2011	16 May 2011
Bicol University, Legaspi City, Albay	23-27 May 2011	28 May 2011



Typhoon Tracking and Weather Forecasting

Community/Town Watching



The project also produced a Trainers' Manual on DRRM to serve as guide and reference for participants in conducting similar activities in their respective schools and universities. The participants also prepared their Action Plans they intended to do after the training programs.

A similar activity for the staff of DOST-SEI and representatives from DOST agencies located in Bicutan, was also implemented.

The **SEI Training Workshop on DRRM** coincided with the National Disaster Preparedness Month with the theme *"Makialam, Makiisa. Sa Pagsugpo ng Panganib, May Maitutulong Ka."* It was conducted on 20-21 June 2011 at the William G. Padolina Hall, where 33 SEI staff and 22 representatives from DOST agencies in Bicutan were trained. The following were the resource persons and their respective topics:

Name	Topic
Ms. Nelia Tabliago DRRM Coordinator NDRRMC-Office of Civil Defense	The Philippine Disaster Risk Reduction and Management System
Ms. Charmaine Villamil Science Research Specialist II PHIVOLCS Main Office	Earthquake and Earthquake Hazards
Mr. Joel Jesusa Weather Specialist II PAGASA Main office	Weather Forecasting and Warning Services
Mr. Roy Badilla Asst. Weather Services Chief PAGASA Main Office	Flood Forecasting and Warning Services
Mr. Raymond Thaddeus Ancog Senior Science Research Specialist DENR-Mines and Geosciences Bureau (Main Office)	Rain-Induced Landslides and Hazard Mapping

Strengthening the Capacity of Future Pillars of Science and Mathematics Education. Further contributing to the goal of accelerating the development of Science and Mathematics (S&M) professionals in the country, DOST-SEI helped organize the Conference that was intended to develop a new generation of experts in these fields through exposure to: 1) global and local trends in S&M education; 2) research outputs/technical papers in S&M education; 3) dialogue with experts on the opportunities, issues/concerns and challenges in the fields of S&M education; 4) possible actions to strengthen the S&M education in the country; and 5) collaborative basic and applied research works in S&M education.

Held at the Heritage Hotel in Pasay City on 15-16 November 2011, the Conference was attended by forty-two (42) science and mathematics faculty members from nine (9) Teacher Education Institutions (TEIs) classified as Centers of Development (COD) by the CHED. These were Pangasinan State University-Bayambang (Pangasinan), Holy Angel University (Angeles City), Manuel S. Enverga University Foundation (Lucena City), Catanduanes State University (Virac, Catanduanes), Central Bicol State University of Agriculture (Pili, Camarines Sur), University of San Agustin (Iloilo City), Cebu Normal University (Cebu City), Western Mindanao State University (Zamboanga City) and Xavier University-Cagayan de Oro City.

On the first day, the keynote speaker, Prof. Chun-Yen Chang, Director of Science Education Center of the National Taiwan Normal University presented the topic "From FAT to SLIM: A Taiwanese Perspective of the Future Science and Mathematics Education." In his presentation, he defined FAT as Facts and Truths, while SLIM stood for Scientific Literacy in Media, which he explained as the ability to understand the scientific terms both in science news and secondary school science textbooks. Other resource speakers were:

Name	Designation and Office	Topic
Dr. Merle C. Tan	Director UP National Institute of Science and Mathematics Education Development (UP NISMED)	The State of S&M Teacher Education in the Philippines
Dr. Maricar S. Prudente	Professor, College of Education De La Salle University (DLSU)	Science Education, Creating a Climate of Change
Dr. Rosemarievic Villena-Diaz	Dean, College of Science Philippine Normal University (PNU)	Developing a Mindset for Improving Mathematics Education in the Philippines
Dr. Ian June L. Garces	Associate Professor, School of Science and Engineering Ateneo de Manila University (ADMU)	Mentoring Practices for the Effective Teaching of Science and Mathematics
Dr. Jaime D.L. Claro	Director Information Technology Training Center University of the Philippines (UP-ITTC)	ICT as a Tool in Meeting the 21st Century Challenges in S&M Education
Dr. Catherine Vistro-Yu	Professor, School of Science and Engineering Ateneo de Manila University	Addressing Cultural Differences in the Teaching and Learning of S&M
Dr. Filma G. Brawner	Director Science Education Institute-DOST	Capacity Building of Future Pillars in Science and Mathematics Education

Dr. Filma G. Brawner (middle), Director of SEI, and Ms. Elizabeth A. Fontanilla, Director of DOST Administrative & Legal Services, present the Certificate of Appreciation to Prof. Chun-Yen Chang, Director of Science Education Center of the National Taiwan Normal University and keynote speaker of the conference.

Dr. Auxencia A. Limjap, Science Department Chair of DLSU, served as the lead facilitator during the workshops.

The second day of the Conference was devoted to workshops where teachers were given the opportunity to share information on the issues, concerns, challenges and emerging trends in S&M education, establish collaboration among universities for research and identified short and long-term projects geared towards strengthening the S&M education in the country. As part of their outputs, the participants were asked to identify the challenges in S&M education and strategies to address these, and to develop research topics related to teaching, learning and professional development in order to improve the quality of S&M education.

Alternative Delivery Programs and Innovations

Mobile IT Classrooms (MITC). To promote information technology awareness through hands-on computer activities and expose elementary, high school students and S&T teachers to state-of-the-art education and technology-based alternative methods of learning and instruction, DOST-SEI continued to deploy the custom-made, air-conditioned MITC buses to far-flung areas of the country in 2011.

These buses are each equipped with 32 tiered seats and working tables and stockroom equipped with 17 computer laptops, LCD projector and screen, TV monitor, public address system, courseware and VHS tapes on science and mathematics for elementary and high school levels. These are meant to promote science literary through ITC.

Three MITC units were deployed in Siargao, Camarines Sur and Cebu while one (1) MITC unit in Davao was awaiting its transfer to Zamboanga del Sur pending accomplishment of necessary documents for its official deployment. Before its deployment, 17 laptops and one (1) LCD projector were purchased to replace those equipment that are beyond repair.

DOST-SEI evaluated the request of Partido Development Administration (PDA) for the extension of deployment of one MITC unit (MITC-SGJ 141) to the 4th Congressional District of Camarines Sur. In 2011, the region conducted the Training in Computer Literacy using MITC to 30 schools with 3,892 student beneficiaries and 189 teacher beneficiaries. In Cebu, MITC has already served 15, 278 elementary and high school students.

Technology Package for Student Learning Empowerment: Pilot Testing of Courseware and Tablet PC. Tablet PCs loaded with interactive courseware in Grade 1 Mathematics for SY 2011-2012 were given to pupils in the experimental classes of selected elementary schools in Regions I, IV-A, VIII, X and NCR. The project intends to assess the performance of the Tablet PC vis a vis its intended functionalities, determine the effects and benefits of using digitized learning materials on the academic performance of the target students, and enable concerned agencies to recommend actions based on the results of the pilot study.

The project is considered as one of the High Impact Technology Solutions (HITS) projects of DOST and was presented during the 2011 National Science and Technology Week (NSTW) Celebration held on 28 July 2011 at SMX Convention Center in Pasay City.

During the first quarter of the year in review, the names, duties and functions of the officers and members of the Inter-Agency Committee (IAC) and National Steering Committee (NSC) were identified. Six (6) NSC and two (2) IAC meetings were conducted. Writers and curriculum developers from UP NISMED also identified and prepared the topics, lessons and scripts, while the Advanced Science and Technology Institute (ASTI) performed graphic design, editing and digitization of the courseware and the procurement of Tablet PCs. The courseware was finalized in August 2011 and the bidding of Tablet PC was done in November 2011, with delivery expected in February 2012.

Twenty (20) teachers from selected regions/schools identified by DepEd-Bureau of Elementary Education participated in a training program for the use of the Courseware and Tablet PC at UP NISMED, Diliman, Quezon City.

A pre-pilot run was facilitated by the members of the Monitoring Team from November up to first week of December 2011 in Misamis Oriental and Leyte. The schools selected for pilot testing are:

REGION	SCHOOL
Region 1	Pasuquin Central Elementary School San Nicolas Elementary School
Region IV-A	Tanauan North Central School Lores Elementary School
Region VIII	A.T. Aguja Central School Cassidy Elementary School
Region X	Kimaya Elementary School Jasaan Central School
NCR	Fourth Estate Elementary School San Agustin Elementary School

Pilot Testing of Courseware

Additionally, the following lessons/modules for Grade 1 mathematics were developed and digitized:

TITLE	ACTIVITY
1. Classifying Objects	Activity 1: How are the objects classified? Activity 2: Classifying objects according to a given condition
2. Comparing Sets of Objects and Numbers	Activity 1: How many do I Have? Activity 2: Forming sets of objects
3. Ordering Sets of Objects and Numbers	Activity: Which comes first?
4. Searching for Number Patterns	Activity: What numbers are missing?
5. Adding Whole Numbers	Activity 1: Expressing a number as a sum of two numbers Activity 2: Finding the missing addends/sum
6. Subtracting Whole Numbers	Activity 1: How much money is left? Activity 2: Finding the missing digit/s
7. Partitioning Regions Into Halves	Activity 1: Representing ½ in different ways Activity 2: Finding the whole
8. Partitioning Regions into Fourths	Activity: Representing ¼ in different ways
9. Finding the Whole Region/ Set Given ¼ of It	Activity: Complete Me!
10. Measuring Length Using Nonstandard Units	Activity 1: Estimating the length of an object Activity 2: Which object has this length?

Development of Interactive Courseware in Science and Mathematics for Secondary Level Schools (2nd Year HS). This project was designed to develop Science and Mathematics e-learning modules for secondary level students and that would serve as supplementary educational materials for teachers as well. It is also intended to produce lesson presentations through the use of cost-effective and high quality ICT solutions and enhance teaching strategies of high school Science and Mathematics teachers.

As of December 2011, the project was able to develop and digitize 78 modules – 53 for Mathematics and 25 for Science. From January to February 2012, 20 modules would still be developed for a total of 98 modules.

The following are some of the sample works of the Courseware Team:

Search for Innovative Practices in Managing Large Classes. On 21 February 2011, DOST-SEI launched this annual nationwide program that intends to identify and give recognition to innovative practices in managing large classes that result in effective teaching and learning of science and mathematics. The search is open to all public and private high schools with large (51-70 students) and extra large (71 students or more) classes.

Specifically, this project aims to inspire teachers who handle large and extra large classes in applying innovative practices in teaching and learning science and mathematics, and to sustain collaboration between school and the community on the use of these best practices, including varied digital and non-digital learning resources.

The launch was attended by 100 teachers, principals, science supervisors and school division superintendents from different DepEd division offices in the National Capital Region. For the rest of the regions, copies of the project brochure and DepEd Memorandum were sent to DepEd and DOST offices for dissemination.

After thorough screening and evaluation by the members of the Board of Evaluators, six (6) proposals qualified out of 35 proposals submitted to DOST-SEI. Four (4) of these were from schools in the large class category and two (2) from schools in the extra large category. These proposals are as follows:

Large Class

1. Flock Program in Managing Large Class Size (51-70) in Mathematics IV at Looc National High School, Calamba City – *Looc National High School, Narra St., Looc, Calamba City*
2. I-Motion: An Innovation in Large Classes – *San Isidro National High School, Borneo St., Brgy. San isidro, Makati City*
3. Geotractor: Teaching Students to Teach Themselves – *Andres Bonifacio Integrated High School, Welfareville Compound, Addition Hills, Mandaluyong City*
4. Project 'BADI' (Bacong Differentiated Instruction) – *Bacong National High School, Bacong, Salug, Zamboanga del Norte*

Extra Large Class

1. Sustaining Effective and Holistic Management of Large Classes through Active Life Model – *Las Piñas East National High School, Kasoy St., Verdant Acres Subd., Pamplona III, Las Piñas City*
2. M-CART (Mobile Computer-Aided Reinforcement for Teaching) – *Navotas National High School, M. Naval St., Navotas City*

The six school qualifiers each received a grant of P100,000 to implement their respective innovative practices. Half of the grant was awarded to the qualifiers during the orientation for the Project Team last 08 July 2011 at DOST-SEI in Bicutan, Taguig City. The balance of P50,000 was released after the liquidation of the initial half.

Pilot implementation of the innovative management practices covered the first grading period from June to the first week of August 2011. The final management practice was implemented from the second grading to the third grading period. To commence the Search period, the students of the experimental classes took pre-test of the respective subject where the management practice was showcased.

A monitoring team of three science/math specialists and a staff from DOST-SEI visited the schools to observe the conduct of classes, interview the teacher, Project Team and principal, and conduct a focus group discussion with the students. The monitoring activities were performed by:

1. Dr. Merle C. Tan (UP NISMED)
2. Dr. Soledad A. Ulep (UP NISMED)
3. Dr. Marlene B. Ferido (UP NISMED)
4. Dr. Victoria C. Naval (Pi Lambda Theta)
5. Ms. Elizabeth G. Catao (DepEd)
6. Ms. Ma. Elena M. Estares (NASSPHIL)
7. Ms. Genersol G. Monton (Fort Bonifacio HS)

By the end of 2011, the team had to perform one more round of visits to complete the monitoring activities.

Design and Development of Statistical Software Package. To contribute to the larger goal of improving the country's global competitiveness through S&T research and development, DOST-SEI supported the development of a Statistical Software Package that would aid researchers, particularly educators and graduate students in science and mathematics courses, in conducting researches, theses or dissertations. The package, which can also be used by high school students for their investigatory projects, can serve as guide prior to the conduct of research and aid in the analysis of research data.

Conducted in collaboration with the UP Information Technology Training Center (UP ITTC), the project was conducted from January to December 2011. One statistical software module (basic) has already been developed and digitized, while the second and third modules (intermediate and advanced) are currently undergoing digitization.

The following are the topics included in the modules:

MODULE 1:
1. Frequency Distributions
2. Measures of Central Tendency (group and ungrouped data)
3. Measures of Dispersion (group and ungrouped data)
4. Measures of Position
5. Measures of Skewness and Kurtosis
6. Probability
7. Random variables and probability distributions
8. One-way ANOVA

MODULE 2:
1. Inferential Statistics
2. Sampling Distributions
3. Confidence intervals
4. Hyppthesis testing
5. Chi Square Test

MODULE 3:
1. Simple Correlation and Regression
2. Test Reliability and Item Analysis
3. Multiple Regression Analysis
4. Non-Parametric Methods

S&T Human Resources Studies

Human Resources in Science and Technology (HRST) in the Philippines. As the country continues to move to a knowledge-based economy, the ever-increasing and irrefutable importance of human resources in our emerging S&T sector is becoming as critical as our other economic resources. Investing in human capital is thus central to economic development, which is why data on HRST is important in giving policymakers a better understanding of the demand for and supply of S&T personnel.

Since local studies that estimate the number of highly skilled workers engaged in S&T occupations are scarce, DOST-SEI initiated a research in this area in 2011, intending to provide robust estimates of the country's workforce in S&T using secondary data from the National Statistics Office (NSO) as basis for analysis. The study has the following objectives:

1. To estimate the magnitude of Human Resources in Science and Technology (HRST) in the Philippines;
2. To describe the HRST in terms of age, sex, education and other demographic characteristics; and
3. To determine the disaggregation and geographic spread of HRST by province and region.

DOST-SEI coordinated with the NSO for the census data. Currently, data processing is being undertaken involving the reclassification of occupations of household members using the International Standard Classification of Occupations (ISCO) guided by the Canberra Manual, a document that provides guidelines for the measurement of Human Resources devoted to S&T and the analysis of such data.

The ISCO provides an international standard list of occupations considered as S&T, thus once occupations have been reclassified, estimation of the magnitude and characterization of HRST in the country can be made. Findings of the study and policy implications will be included in a technical report, which is targeted to be published by the last quarter of 2012. Together with the data from the Migration studies, a good picture of the status and supply of HRST in the country will be drawn, providing a better guide for policymakers on crafting legislations concerning improvement and maintenance of human capital in S&T.

Tracer Study of DOST-Scholar Graduates: An Initial Report. DOST-SEI released the initial report of the Tracer Study upon completion of its three phases, namely: (1) Development of Tools for Data Gathering, (2) Building-Up of the Scholar-Graduates Database, and (3) Data Analysis and Preparation of Initial Report. Part of the agency's mandate of accelerating the development of S&T human resources pool is to monitor its scholars even after their college graduation. The purpose is not just to develop and manage a database of scholar-graduates but also to determine their current situations and career movement, and whether or not they have indeed contributed to the country's socio-economic development efforts through employment in public or private industries or through self-employment in their areas of specialization.

Data from a total of 2,338 scholar-graduates, representing 11.4% of the total graduates from 2000 to 2011, were included in the analysis. Among these were 2,002 RA Scholars (about 11.3% of the total RA graduates from 2000-2011) and 236 Merit scholars (16.8% of 2000-2011 Merit Scholar-graduates). The number of RA scholars was highest in 2003 at 18.9% while Merit scholars stood most in 2005 at 31.2% ***(see Table 3)***.

Seventy-five percent (75%) of those who accomplished the TRACER form took up BS courses under the RA Scholarship Program, followed by those who enrolled in Technician courses (20%)

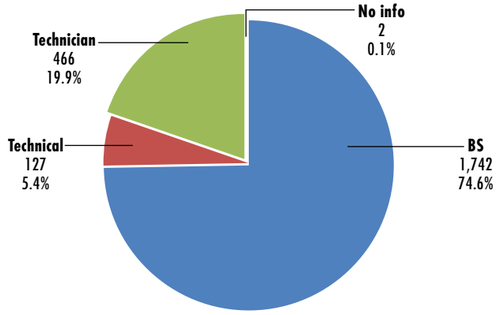


Fig.1: Distribution of Scholar-Graduates by Type of Course Taken

At the time they accomplished the form, the scholar-graduates were already disaggregated by employment status. Eight (8) out of 10 or 82% of them were employed, although a significant percentage, 17%, were also unemployed, while 20 subjects, representing 1%, were self-employed.

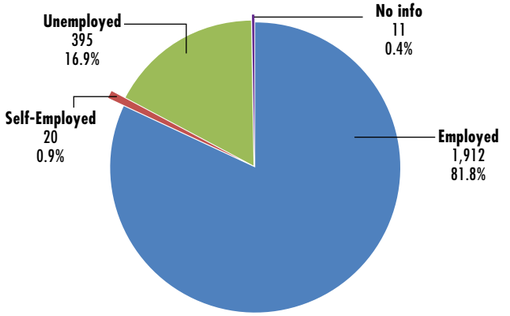


Fig. 2: Distribution of Scholar-Graduates by Current Employment Status

More than half (51%) of the graduates took Engineering courses; almost a quarter had Technical/Technician courses; and 12.6% took IT/ICT courses.

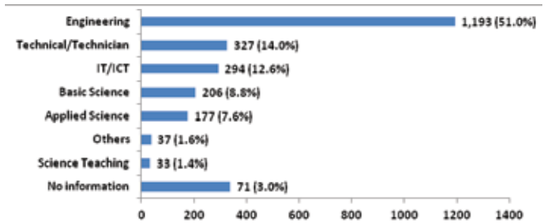


Fig. 3: Distribution of Scholar-Graduates by Course (Grouped)

At the time they accomplished the form, about 3 out of 10 were working in the Engineering field, the highest at 31.9%.

TABLE 3: Distribution of Subjects by Year of Graduation and Scholarship Program

Year Graduated	RA 7687			MERIT			JLAP			PHYSICS			ALL		
	Total Grad	TRACER	% of Grad	Total Grad	TRACER	% of Grad	Total Grad	TRACER	% of Grad	Total Grad	TRACER	% of Grad	Total Grad	TRACER	% of Grad
<2000		88			26			8			16			138	
2000	2010	85	4.2	101	5	5	49	3	6.1	62	3	4.8	2222	96	4.3
2001	1584	149	9.4	146	8	5.5	34	0	0	107	4	3.7	1871	161	8.6
2002	1301	157	12.1	129	12	9.3	0	0	0	83	4	4.8	1513	173	11.4
2003	1761	331	18.8	139	32	23	39	1	2.6	10	4	40	1949	368	18.9
2004	1554	285	18.3	134	39	29.1	22	0	0	78	8	10.3	1788	332	18.6
2005	1942	328	16.9	77	24	31.2	67	17	25.4	55	4	7.3	2141	373	17.4
2006	1886	244	12.9	132	22	16.7	46	13	28.3	80	3	3.8	2144	282	13.2
2007	1528	118	7.7	108	15	13.9	0	0	0	18	1	5.6	1654	134	8.2
2008	1270	169	13.3	86	24	27.9	15	3	20	24	2	8.3	1395	198	14.2
2009	869	94	10.8	109	27	24.8	250	19	7.6	23	2	8.7	1251	142	11.4
2010	821	27	3.3	118	19	16.1	250	8	3.2	9	0	0	1198	54	4.5
2011	1233	15	1.2	126	9	7.1	84	1	1.2	1	0	0	1444	25	1.7
ALL	17759	2002	11.3	1405	236	16.8	856	65	7.6	550	35	6.4	20570	2338	11.4

The second highest percentage, at 23%, was among other subjects involved in non-S&T fields. Twelve percent (12%) have jobs in Technical fields, while the bottom two, 1.8% and 1.3%, belonged to those working in Basic and Applied Sciences, respectively. Almost a quarter of them did not give information regarding their occupation.

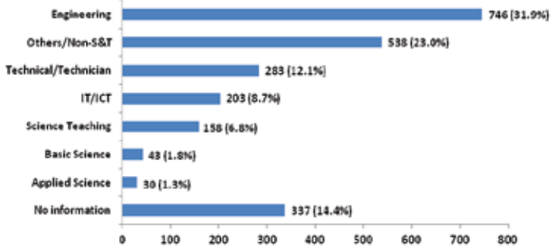


Fig. 4: Distribution of Scholar-Graduates by Occupation (Grouped)

The table below presents the top 20 companies, all in the private sector, where most of the scholar-graduates are working. The highest is Accenture, Inc., a business process outsourcing company, taking in more than a hundred of the scholar-graduates. A distant second in rank is Hewlett Packard AP (Hong Kong) Ltd., a computer manufacturing company, with 35 subjects working. Third is Amkor Technology Philippines, Inc., with 28 subjects working in this semiconductor company. Fourth, another semiconductor company On Semiconductor Philippines, Inc., employs 24 subjects. Fifth is Analog Devices, Inc. and Canon Information Technologies Philippines, Inc., both having 21 subjects working in their premises.

Name of Company	Number of Scholars
1. Accenture, Inc.	108
2. Hewlett Packard AP (Hong Kong) Ltd.	35
3. Amkor Technology Philippines, Inc.	28
4. On Semiconductor Philippines, Inc.	24
5. Analog Devices, Inc.	21
6. Canon Information Technologies Philippines, Inc.	21
7. Japan Gas Corporation Philippines, Inc.	20
8. Cypress Manufacturing Limited	19
9. Emerson Electric Asia (LTD.)- Rohq	19
10. IBM Daksh Business Process Services Philippines, Inc.	18
11. Maxim Philippines Operating Corp.	17
12. Sykes Asia, Inc.	17
13. Sun Power (Phils.) Manufacturing Ltd.	16
14. Allegro Microsystems Philippines, Inc.	15
15. Smart Communications, Inc.	14
16. Convergys Philippines Services Corporation	13
17. Teleperformance Philippines, Inc.	13
18. Hitachi Global Storage Technologies Philippines Corp.	12
19. Procter & Gamble Philippines, Inc.	12
20. Rohm Electronics Philippines, Inc.	12

Migration of S&T Manpower – Part II. OFWs. DOST-SEI completed in 2011 the second part of the two-part study on migration of Filipino S&T manpower. While the first part, entitled "Emigration of Science and Technology-educated Filipinos (1998-2006)" explored and identified the general profile of Filipinos who have chosen to migrate permanently to other countries, the second study provides a picture of temporary migration among Filipinos, specifically Overseas Filipino Workers (OFWs) who have S&T occupations or jobs classified as S&T by the International Labor Organization (ILO).

Secondary data on the deployment of OFWs from the Philippine Overseas Employment Administration (POEA), covering the period 1998-2009, was used in the analysis. The occupations of OFWs were also reclassified using the International Standard Classification of Occupations (ISCD), as stated in the Canberra Manual prepared by the Organization for Economic Cooperation and Development (OECD). Based on this manual, the major classifications of S&T occupations are: 1) Physicists, Chemists and Related Professionals; 2) Mathematicians, Statisticians and Related Professionals; 3) Computing Professionals; 4) Engineers and Related Professionals; 5) Life Science Professionals; 6) Nursing and Midwifery Professionals; and 7) Health Professionals (except Nursing). Data was processed and analyzed using the Statistical Package for Social Sciences (SPSS).

Major findings of the study are as follows:

- For the annual flow of newly hired OFWs, the trend is similar to that of the stock estimates, with the Middle East as the major destination, followed by Asia. In general, an upward trend has been observed, except for a sudden drop in 2003. From 1998 to 2009, the total number of OFWs increased by 51% from almost 220,000 in 1998 to around 332,000 in 2009 ***(see Figure 5)***.
- Six percent (6%) of the total number of OFWs were engaged in S&T occupations, on the average of the 12-year annual flows, translating into an annual flow of 16,000 S&T manpower outflow. From the lowest outflow rate of 2% in 1999, the migration peaked at 7% in 2009, when the highest percentage of OFWS who left the country was recorded ***(see Figure 6)***.

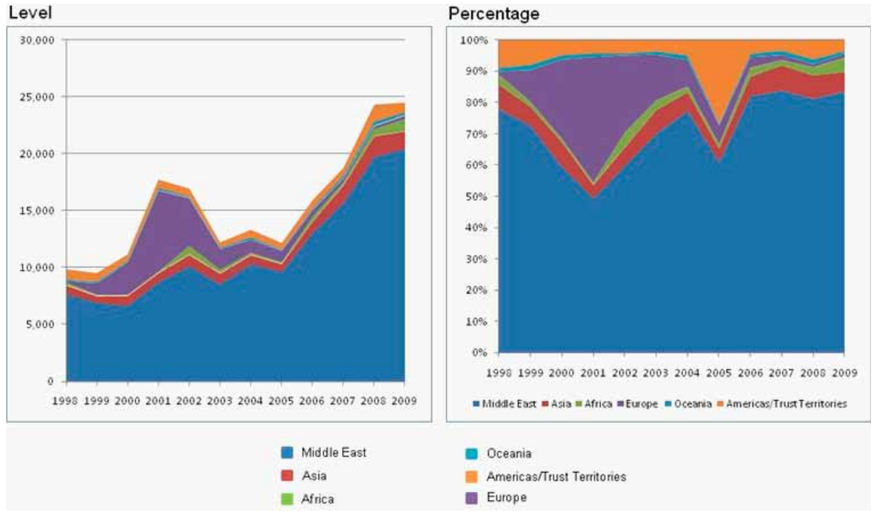


Fig. 5: Annual Flow of S&T OFWs by Region, 1998-2009

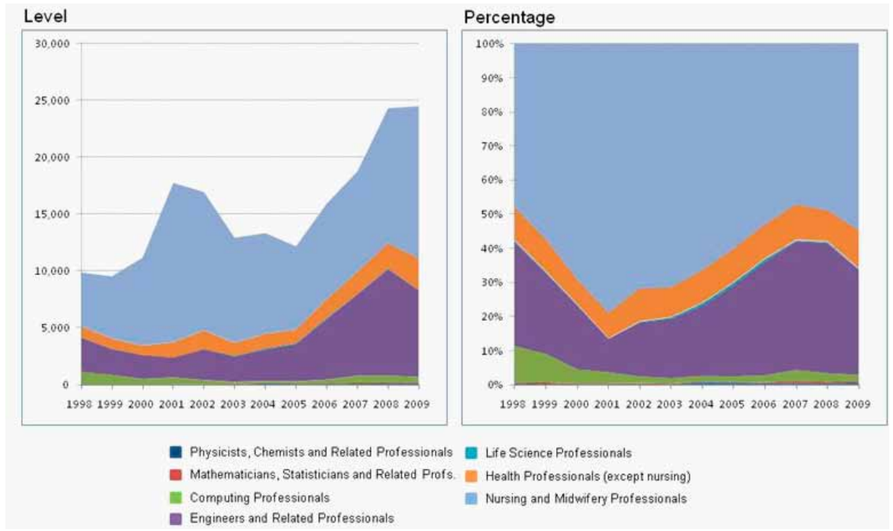
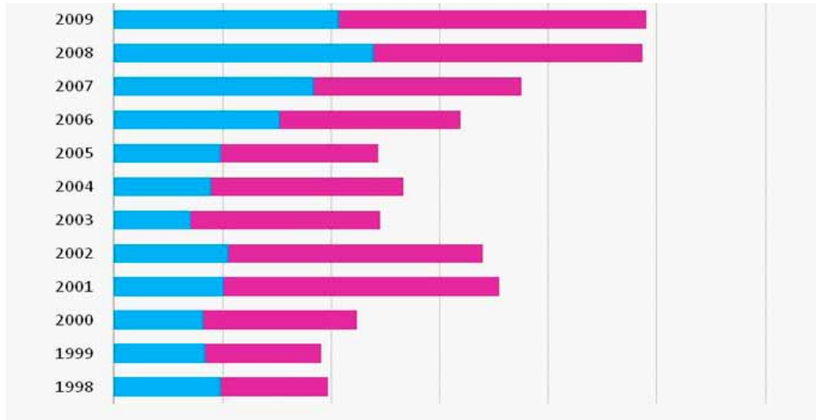


Fig 6: Annual Flow of S&T OFWs by Occupation, 1998-2009

- In absolute figures, the outflow of Filipino S&T workers started with 9,877 in 1998 to 24,502 in 2009, an increase of about 148%. In terms of sex disaggregation, there were consistently more female S&T temporary migrants than males across the years. the ratio of female to male S&T OFWs was highest in 2000-2005 at 2:1 ***(see Figure 7)***.
- The majority of S&T OFWs take up nursing and midwifery, followed by engineering and related professions as well as health. In terms of volume, the engineering professional group is increasing in recent years while the health professionals group has changed little ***(see Figure 6)***.



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Male	4,903	4,200	4,116	5,052	5,279	3,535	4,477	4,893	7,621	9,176	11,965	10,348
Female	4,973	5,346	7,070	12,704	11,688	8,706	8,860	7,289	8,323	9,591	12,364	14,153

Fig. 7: Annual Flow of S&T OFWs by Sex, 1998-2009

TABLE 4: Top Ten Countries of Destination by Average Rank, Frequency of Occurence, and Average Number of S&T OFWs during the Period of 1998-2009

Country	Average Rank	Frequency of Occurrence	Average No. of S&T OFWs
Saudi Arabia (Middle East)	1.0	12	9066
United Arab Emirates (Middle East)	3.4	12	1030
United States (Americas)	4.3	12	581
Singapore (Asia)	5.1	12	521
Kuwait (Middle East)	6.2	11	356
Qatar (Middle East)	4.9	10	836
Libya (Africa)	7.5	10	282
Ireland (Europe)	6.4	7	521
United Kingdom (Europe)	2.4	7	2165
Bahrain (Middle East)	9.0	6	190

- Five of the top ten countries of destination are in the Middle East, with Saudi Arabia as the top receiving country for the past 12 years. Next preferred countries of destination are the United Arab Emirates, United States and Singapore ***(see Table 4)***.

data, is conducted every quarter to obtain information on educational attainment of every member. The survey also determines whether or not each member is an OFW. Although LFS covers only a smvall part of the population, it can provide estimates of the number of OFWs with

These findings were presented to various stakeholders in a consultative meeting to obtain further insights and recommendations that could be used by decision-makers in developing policies that would increase, sustain and foster the development of the country's pool of S&T human resources.

The following were the recommendations given during the consultative meeting:

On the need for more information on OFWs.

- Use of NSO data particularly Labor Force Survey (LFS)

degrees on engineering, medical courses and other occupational groups and data trend.

- Look into the possibility of coordinating with the International Organization for Migration (IOM), an inter-agency organization that keeps databases containing more information regarding OFWs.
- Improve the system of tracking OFWs and consolidate information, e.g., the case of Filipinos exiting as tourists and returning as OFWs. Currently the POEA is studying the possibility of getting additional information from OFWs.
- Conduct more in-depth studies that would provide, in addition to statistics, the rationale for working in other countries besides the economic point of view.

On the issue of mismatch between education and manpower requirement.

- Review the current curriculum of S&T courses as their graduates may seldom be meeting the requirements of hiring firms. Academic institutions could engage in more industry tie-ups to determine actual industry needs and ensure immediate employment of their graduates.
- Enhance the S&T education system to ensure high quality and more globally competitive graduates. While the country has a growing need for graduates in the field of engineering, for example, it is being neglected because engineering graduates often fail to meet the minimum qualifications.

On the issue of globalization and the forthcoming ASEAN community in 2015.

- Take globalization as a challenge to become more competitive, since the mobility of S&T workers is inevitable particularly in view of the forthcoming ASEAN community.
- Consider how to best leverage on the benefits of migration, since it means more economic returns for the country and advancement in skills for local S&T workers.

Other issues worth considering in legislation and creation of policies and strategies:

- Meet the big challenge of providing for the proper ecology and environment for our S&T workers and the improvement of R&D infrastructure in the country. These investments will help retain and even increase our pool of Researchers, Scientists and Engineers (RSE), especially MS and PhD graduates. This is crucial for us to catch up with the ever-increasing benchmark number of RSEs needed by a country to become industrialized.
- Strengthen the partnership between government and industry to help the latter recognize the existence of local human capital for research instead of relying on and hiring foreign consultants.
- Review industrial policies to make the country more viable for foreign and local investments relating to S&T. The Korean model may be used as an inspiration to shift our economic paradigm from being service-based to industry-based.
- Review and, if necessary, amend existing laws on migration, especially in view of the aforementioned concerns.

Evaluation of SEI Programs and Projects. To ensure that DOST-SEI's programs and projects are achieving their objectives and effectively making an impact on the communities it serves, and on the nation in general, the agency conducted from January to December 2011 monitoring and evaluation of its key undertakings. Three (3) evaluation reports were done, particularly for the following projects: Science Explorer, Science Camp, and Tagisang Robotics.

The highlights of each report are as follows:

Science Explorer

- Elementary and high school students using this learning method showed positive response
- The students had a fun time doing the activities in the Science Explorer as shown by the high rating for Statement 1: "Nakatutuwa ang mga ginagawa namin sa Science Explorer." The statement garnered a score of 4.96, which is nearest to the top score of 5 (Strongly Agree).
- Female students find the Science Explorer activities more novel, as indicated by the high scores they gave to the statements compare to male students.
- However, both sexes showed the least agreement for Statement 4: Nagkaroon ako ng interes na maging scientist or engineer balang araw." This indicates that more efforts must be exerted to develop awareness and interest in science and mathematics.
- Moreover, the fact that elementary students gave a higher score for Statement 4 than high school students means that a more sustained effort must be made to maintain an interest in science that was started at a young age.
- The comments given by the students provide some insights on ways to improve the delivery of services by the Science Explorer bus. Some of these comments touch on the following points: regulating the temperature inside the bus to make learning more conducive; management / control of the class; more interactive activities; and use of microphone to make the lessons audible to the whole class.

Science Camp

- In general, statements regarding field or applied factors got higher ratings than those about classroom-based or theoretical factors. This indicates that hands-on activities are more significant for students as well as for teachers, so more time should be allotted to hands-on activities than to lectures. Making lectures more interactive is also highly recommended to encourage more student involvement and interaction.
- The lowest ranking statement – "Relevance of topics to the student-campers' decision in what to take in college" – indicates that students already have preconceived interests and attitude toward science that can hardly be altered by a one-time activity, since other factors come into play such as the courses taken by their siblings, parents' profession, prior exposure to science, and the like. Thus it is recommended that the Science Camp should also accommodate lower year levels instead of just fourth year high school students. The earlier students are exposed to this kind of activity, the more likely they will be influenced to take up science courses in college.
- Topics found more useful or interesting by campers include marine geology, basic snorkeling, coral reefs, and phytoplankton microscopy. Activities found most enjoyable are snorkeling, giant clam exposure, sea grasses/sea wein teds, and community immersion. More useful and interesting topics and enjoyable activities should be noted and incorporated in future camps.
- Most of the open-ended comments are positive and congratulatory, expressing students' enjoyment, learning and gratitude. Some suggestions include shortening the lectures, omitting more activities after a tiring field exposure, serving more sea foods, having more interactive lectures and lengthening the camp duration.

Tagisang Robotics

- In terms of overall experience, the rating of respondents, which include both the participants and the general public, was positive, with more than half saying that the activity met their expectations.
- In terms of the event components, highly-rated aspects pertain mostly to group efforts and involvement of team members. Only a few touched on the event management itself. On the other hand, technical support and related aspects garnered low ratings, indicating a need to address concerns such as the fairness of the scoring system, the usefulness of manuals provided in the kit, adequacy/ completeness of parts to build the robots, usefulness of instructions given in the website, acceptability of the cost of KOP (for private schools only), fairness of referee's judgment/calls, clarity of game mechanics, and relevance/usefulness of the topics discussed.
- Nevertheless, some commendable aspects of technical management were noted and are worth mentioning, such as the appropriateness of the competition venue, safety/ security provided by the organizers, conduciveness of venue for training, and adequacy of time given for building the robot.
- Since one of the major objectives of this activity is to entice students to pursue Science careers, it is worth noting that there are eight (8) cases of students who switched from non-science courses to science-related courses they wished to pursue in college.
- Among the general public, the highest rated statement is about recommending the activity to be held annually. They likewise gave a high rating on the appropriateness of venue for the competition.
- Also providing insights for further improvement are the comments that touch on the fairness of the scoring system, shortness of allotted time for every game, the effectiveness of the technical training, game mechanics, and technical manual, and clarity of the rules.

Publication of Science and Mathematics Frameworks. After months of careful planning and discussions involving some of the best minds in the field of science and mathematics, the Institute published and disseminated in 2011 four frameworks, namely: 1) *Mathematics Framework for Philippine Basic Education*; 2) Science Framework for Philippine Basic Education; 3) *Framework for Philippine Mathematics Teacher Education*; and 4) F*ramework for Philippine Science Teacher Education*.

These publications are intended to enable policy-makers program planners, academic institutions, curriculum developers, teachers and researchers meet the goal of coming up with effective science and mathematics teaching methods and bring the country closer to having scientifically, technologically, environmentally literate and productive individuals through quality science and mathematics education.

The Mathematics Framework for Philippine Basic Education and the ***Science Framework for Philippine Basic Education*** contain resources in helping design and implement mathematics and science curricula that empower students to "learn how to learn" and better understand and use science and mathematics in their everyday life. Although the strategies cover only Grades 1-10 for science and K-11 for mathematics, the progressive nature of the concepts involved in curriculum development in both science and mathematics could be easily extended to cover the K-12 educational setting.

The Framework for Philippine Mathematics Teacher Education could guide higher education institutions, professional organizations of mathematics teachers and school administrators in assessing and improving the performance and career development of mathematics teachers based on a set of standards. The qualities of effective mathematics teachers in terms of what they know (content knowledge), what they are expected to do to achieve quality learning outcomes (pedagogical knowledge) and what they should possess to be able to manage the different aspects of the teaching and learning process (management skills), upon which the standards are based, are also included.

The Framework for Philippine Science Teacher Education contains resources that will help teacher education institutions, university science professors and school administrators assess and improve the performance of science teachers using standards-based rubrics. Just as with the Framework for Mathematics Teacher Education, the qualities of effective science teachers based on their knowledge, practice and attributes are also anchored on the objective of raising the quality of science education.

DEVELOPING SCIENCE AND TECHNOLOGY CULTURE

INDUSTRY AND EDUCATION, private and public institutions continually show that their symbiosis results in wide-ranging benefits for everyone seeking to improve the state of our S&T culture and competitiveness. This is evident in the annual competitions that Filipino students and educators take part in, generously supported by DOST-SEI as well as its partners in different sectors. Hence, these partnerships must constantly be nurtured and expanded to ultimately benefit the country.

Early and meaningful interventions provide the much-needed platform for creating an interest in science and technology subjects – interest that often lasts a lifetime among the youth. Exposure to the regional and global S&T competitions brings priceless perspectives to the impressionable minds of our youth, from primary, secondary and tertiary levels, inculcating their desires to launch careers in engineering and technology.

Promoting S&T through Science and Mathematics Competitions

LOCAL COMPETITIONS

14th Philippine Mathematical Olympiad (PMO). As the oldest and most prestigious national mathematics competition among secondary school students in the country, the PMO serves as the portal for its winners to take part in the training for the International Mathematics Olympiad (IMO). Organized by the Mathematical Society of the Philippines in cooperation with DOST-SEI, this event aims to improve mathematics education in the country by awakening greater interest in mathematics among students and teachers.

The 14th PMO was implemented successfully in three (3) stages of competition with the participation of schools from all over the country.

The Qualifying Stage served as the elimination stage which included a two-hour multiple choice exam with 30 questions. It was held in October 2011 in the areas of Luzon, Visayas, Mindanao, NCR, participated in by 3,851 high school students. Those with the top 50 scores from each area moved on to the Area Stage of the competition in November, with 206 qualifiers undergoing the examination composed of 20 non-multiple choice questions. The top three (3) scorers in each area were declared Area Winners while the top 20 scorers moved on to the National Stage held on 28 January 2012.

2011 PMO Winners		
Award	**Name of Student-Awardee**	**School**
First Place	Henry Jefferson Morco	Chiang Kai Shek College
Second Place	Mikaela Angelina Uy	St. Jude Catholic School
Third Place	Kenneth Co, PSHS	Philippine Science High School (Main Campus)

10th Philippine Robotics Olympiad (PRO). The PRO marked its 10th year with an ever-growing number of participating students from public and private schools. This annual science educational event aims to challenge the intellectual and critical thinking skills of the youth through two categories: the Regular Category consisting of a playing field across which robots would have to traverse and earn points; and the Open Category in which the participants showcased the theme of the competition using several robotic creations.

The PRO winners & their coaches with SEI Director, Dr. Filma G. Brawner and FELTA Pres./CEO Ms. Mylene Abiva.

PMO winners with SEI Director Dr. Filma G. Brawner, MSP President, Dr. Jumela F. Sarmiento, and other sponsors

Sixty-five (65) high school teams and 46 elementary teams participated in the preliminary competition. The Board of Judges selected 31 teams from the high school level and 21 teams from the elementary level to compete in the finals. In the Open Category 12 teams were selected from high school, four (4) teams from elementary level and five (5) teams for Robot Soccer.

10th PRO winners			
Level	**Award**	**Regular**	**Open**
Elementary	First Place	Tibagan Elementary School	Grace Christian School
	Second Place	Comembo Elementary School	Dr. Yanga's College
High School	First Place	Grace Christian College	International School of Manila
	Second place	First Asia Institute of Technology & Humanities	Dr. Yanga's College
Robot Soccer**	First Place	Philippine Science High School-Bicol Campus	

***Special Category*

Tagisang Robotics: Design, Build, Play. When the Philippines participated in the FIRST Robotics Competition (FRC) Hawaii Regional in March 2009, the potential of Filipino students in the field of robotics shone. Although it was the country's first time to participate in such an event, the Philippine team garnered the Rookie All-Star and Highest Rookie Seed Award, proving the students' capability to compete at a high level. These achievements qualified the local contingent to the FRC Championship in Atlanta, Georgia, and have even made a dent on the relevance of robotics as a field that should be emphasized in the curriculum of Philippine schools.

Taking off from this experience, the *Tagisang Robotics: Design, Build and Play* was developed and implemented as the only varsity type robotics competition in the Philippines, founded on the ideas of *"Pagyabong, kalinangan at pagkakaisa sa gitna ng pakikipagtunggali."* The aim of the competition is to enable the participants to harness their skills by learning and cooperating with others, while being on a highly competitive environment. The project encourages students to think out-of-the-box solutions to challenges posed before them and execute their ideas into action.

Twenty-two (22) school teams from public and private science high schools and science and technology-oriented high schools, including the Philippine Science High School Main, participated in the competition. These are:

1. Bangkal High School
2. Benigno "Ninoy" Aquino High School
3. Caloocan High School
4. Caruhatan National High School
5. Las Piñas Science High School
6. Makati Science High School
7. Manila Science High School
8. Muntinlupa Science High School
9. Parañaque Science High School
10. Pasay City Science High School
11. Pasig City Science High School
12. Philippine Science High School- Main Campus
13. Quezon City Science High School
14. Rizal National Science High School
15. Taguig Science High School
16. Tibagan High School
17. Valenzuela City Science High School
18. Dr. Yanga's Colleges, Inc.
19. Grace Christian College
20. Hope Christian High School
21. La Salle Greenhills
22. St. Paul Colleges of Makati

Each school had a team composed of 10 students and a Coach, who were given a week of extensive training on basic programming and electronics concepts relevant in building robots. The training ran from 31 May to 04 June 2011 at the Philippine Science Centrum in Marikina City.

DOST-SEI provided each team with a common Kit-of-Parts (KOP) free of charge to those from public high school, and at cost to those from private schools. These packages were distributed on 28 July 2011 during the Game Reveal held at the Music Hall of SM Mall of Asia in Pasay City. Thousands of students witnessed the Game Demo and tried manipulating the prototype fabricated robots for them to understand the mechanics of the game designed for the competition. SM Prime Holdings, through the Nido Fortified Science Center, sponsored the event by providing the venue free of charge.

The teams started building their robots only after the Game Reveal on 28 July 2011 up to the first day of the competition (Practice Day). During this period, they were allowed to seek the help of engineers in the industry or the academe to advise them on the design and build of their robots. The students, however, were expected to take active roles in all aspects of the robot design and build, and in playing the game during the final competition. In preparation for the final competition, a second technical training was conducted on 25 September 2011 at the E.F. Alabastro Multipurpose Hall, Philippine Science Heritage Building, SEI, DOST Complex, Taguig City.

The final competition was held on 26-28 October 2011 at One Esplanade, SM Mall of Asia in Pasay City and was attended by more than 400 students, teachers and robotics enthusiasts. Major media groups from print, radio and television covered the event.

Grace Christian College's Team Gracean Whiz won the Best Team Award and received P100,000 cash prize, trophy and medals for each member. Their coach also won Best Team Coach Award and received P30,000 cash prize and a medal.

Dr. Yanga's Colleges Inc.'s Team DYCI Trojans, Rizal National Science High School's Team R-11 Mekanismo and Grace Christian College's Team Gracean Whiz won the Best Alliance Award. Each school received P50,000 cash prize, trophy and individual medals. Their respective coaches also received P10,000 each plus individuals medals for winning the Best Alliance Coaches Award.

Special awards were also given to all the teams to acknowledge the efforts of their members in building their robots. Philippine Science High School Main Campus' Team Liyab won the National Instruments Best Engineering Award; Caloocan High School's Team Mechanical High won the Felta's Most Popular Robot Award and Alaxan Most Popular Team Award; while the Muntinlupa Science High School's Team MunSci Jailbreakers won the Thinklab's Best Blog Award.

Engr. Percival Magpantay of UP-EEEI heads the Inspection Committee to make sure every team complies to the Game Rules and Mechanics.

BPI-DOST Best Project of the Year Awards. This yearly undertaking of the DOST and BPI Foundation, Inc. gives recognition and incentives to students who excel in the fields of science such as mathematics, physics, chemistry, engineering, computer science and biology. Participants in this project are graduating students from 10 BPI accredited universities.

For School Year 2010-2011, 30 students from the 10 schools submitted their research papers for preliminary screening. As in the previous years, six experts from the DOST (three during preliminary and three during final screening) evaluated the research papers on the technical aspects, while the evaluators from BPI focused on the business aspect.

During the preliminary screening, the judges selected the top 12 projects, which was then reduced to six (6) as finalists for the oral presentation held on 28 January 2011 at the Vigan Room of BPI Bldg., Makati City.

The table below summarizes the results of the oral presentation:

Award won/amount	Name of student/school	Project Title
Best Project of the Year/ P50,000 plus Trophy & Certificate from BPI	Ahmed Abdullah Khayef – St. Louis University, Baguio City	Translating Words Through Synthesized Sign Language Avatar
1st Runner-up/ P30,000 plus Trophy & Certificate from BPI	Jomuel A. Velandres – UP Los Baños	Selective Recovery of High Purity Silver from a Local Gold Smelting Wastewater
2nd Runner-up/ P10,000 plus Trophy & Certificate from BPI	Kimberly B. Lucero – University of San Carlos, Cebu City	Effects of Two Entomopathogenic Fungi, Beauveria Bassiana and Metarhizium Anisopliae, on Diamondback Moth (Plutella Xylostella) Larvae under Varying Temperature

The winners of the BPI-DOST Best Project of the Year Awards with their coaches, SEI Deputy Director, Dr. Leticia V. Catris, DOST-Undersecretary Fortunato T. Dela Peña & BPI Officials during Awarding Ceremonies.

INTERNATIONAL COMPETITIONS

Philippine Participation to the International Mathematical Olympiad (IMO). After undergoing intensive and extensive summer training, the Philippines sent its delegation to the International Mathematics Olympiad (IMO), the most prestigious and most difficult mathematics competition among the best secondary students in the world, held on 12-24 July 2011 in Amsterdam, Netherlands.

The IMO and ISEF winners with His Excellency Pres. Benigno Aquino III, DOST Sec. Mario Montejo, Dr. Filma Brawner, IMO and IPHO team leaders/coach and officials of Intel Philippines

The 52nd IMO drew 564 student-contestants from 104 countries and territories, with each country delegation headed by a Team Leader and Deputy Team Leader. The five-man Philippine team was composed of Henry Jefferson Morco of Chiang Kai Shek College; Carmela Antoinette S. Lao and Vance Eldric Go, both of St. Jude Catholic School, Manila; Kenneth Co of Philippine Science High School, Quezon City; and Russelle Guadalupe of Valenzuela City Science High School. The students were joined by Deputy Team Leader Dr. Julius M. Basilla of UP Diliman and Team Leader Mr. Glen C. Ong of Oracle Corporation.

The delegates were selected by the Mathematical Society of the Philippines (MSP), which sponsored their participation to the IMO alongside DOST-SEI and other mathematics organizations in the country.

Three members of the Philippine Team, namely, Henry Jefferson Morco of Chiang Kai Shek College, and Carmela Antoinette S. Lao and Vance Eldric Go, both of St. Jude Catholic School, Manila, reaped individual bronze medals.

Winners of the IMO together with the winners of the International Science & Engineering Fair (ISEF) and International Physics Olympiad (IPHO) made a courtesy call to President Benigno C. Aquino III on 23 August 2011 in Malacañang Palace. They were accompanied by DOST Secretary Mario G. Montejo, SEI Director Filma G. Brawner, Dr. Jose Perico H. Esguerra of IPhO, Dr. Julius Basilla of IMO, and Ms. Arlita Narag and Mr. Ricky Banaag of Intel Philippines.

2011 Australian Mathematics Competition (AMC). Continuing the country's notable accomplishments in the field of mathematics, several Filipino students brought home medals and other prizes after taking part in the annual correspondence-based mathematics competition, the Australian Mathematics Competition (AMC), which is administrated by the non-profit Australian Mathematics Trust (AMT).

A total of 3,442 students from Grade 3 up to second year college took the AMC examination on 4 August 2011 nationwide, simultaneous with students from other participating countries like Australia, Bulgaria, China, Hong Kong, Malaysia, New Zealand, Singapore, South Korea, Taiwan and Thailand. The AMC was held in cooperation with the Mathematics Trainers' Guild (MTG) of the Philippines, DOST-SEI, and the DOST Regional Offices.

Based on the results released in October 2011, four (4) local students were named among the 2011 AMC medalists:

1. Adrian Reginald Sy – St. Jude Catholic School
2. Seanne Daphne Ng – St. Jude Catholic School
3. Justin Yturzaeta – Jubilee Christian School
4. Henry Jefferson Morco – Chiang Kai Shek College

Recipients of the AMC Prize Award, given to those who make it to the top one percent of contestants, were:

1. Audrey Sy – St. Jude Catholic School
2. Jinger Chong – St. Jude Catholic School
3. Matthew Angelo Isidro – St. Jude Catholic School
4. Andrea Jaba – St. Jude Catholic School
5. Miguel Lorenzo Ildesa – Paref-Westbridge School, Inc.
6. Andrew Lawrence Sy – Xavier School
7. Sterling Alvin Tiu – St. Stephen's High School

AMC Prize Awardees with AMT Executive Director Prof. J. Taylor, Hon. Byrne of the Australian Embassy, SEI's Dr. Brawner, and MTG Pres. Chua.

Sixty (60) other students garnered High Distinction certificates for being in the top two percent of examiners in their year level while ten students received Prudence Awards.

The awarding ceremony was held on 31 October 2011 at Century Seafood Restaurant, Century Park Hotel, Manila graced by AMT Executive Director Prof. Peter Taylor, Australian Embassy's Minister and Deputy Head of Mission Hon. Andrew Byrne, SEI Director Dr. Filma G. Brawner, and MTG President Dr. Simon L. Chua.

2011 World Robot Olympiad. The first and second placers in the elementary and secondary levels of the regular and open categories in the Philippine Robotics Olympiad (PRO), including their coaches, school administrators and organizers, represented the Philippines in the World Robot Olympiad (WRO) on 17-20 November 2011 in Abu Dhabi, United Arab Emirates.

The WRO is an annual event that brings young people all over the world to develop their creativity and problem-solving skills through challenging and educational robot competitions. The competition is hosted and organized by a different country each year.

Philippine delegates with SEI Director Dr. Filma G. Brawner, FELTA Pres. & CEO Ms. Mylene Abiva and WRO organizers in Abu Dhabi.

The Philippine delegates came from the following schools:

Elementary level – *Regular Category*
1. Tibagan Elementary School
2. Comembo Elementary School

Elementary level – *Open Category*
1. Grace Christian College
2. Dr. Yanga's College, Inc.

High School level – *Regular Category*
1. Grace Christian College
2. First Asia Institute of Technology & Humanities

High School level – *Open Category*
1. International School Manila
2. Dr. Yanga's College
3. Grace Christian College

Robot Soccer:
Philippine Science HS – Bicol Region Campus

The awards garnered by the team are summarized in the table below:

Awards	Category	School
Best Technical Award	Open-High School	Dr. Yanga's College
4th Place	Open-High School	Dr. Yanga's College
5th Place	Open- High School	International School of Manila
5th Place	Regular-High School	PSHS –Bicol Region Campus
Top 15	Regular-High School	First Asia Institute of Technology & Humanities

8th International Mathematics and Science Olympiad (IMSO) for Primary Schools. The Philippines hosted for the first time the 2011 International Mathematics and Science Olympiad (IMSO) for Primary Schools on 2-6 September 2011 in Villa Caceres, Naga City. It was organized by the Mathematics Trainers' Guild (MTG) in cooperation with the Naga City government, Department of Interior and Local Government (DILG), DOST-SEI and DepEd.

The Olympiad had the theme "Developing Smart, Skilled and Creative Children through Competition for Excellence" and was participated in by 600 students, coaches, math educators, parents and guests from 12 countries, including the Philippines. DOST-SEI hosted a welcome dinner for IMSO VIPs, coaches and jurors on 3 September 2011 at the Avenue Plaza Hotel. It was graced by DILG Secretary Jesse M. Robredo and around 100 guests.

The Philippine team composed of students from NCR, Region 4A and Naga City in Region 5 garnered a total of 28 medals (4 gold, 7 silver and 17 bronze) in mathematics and another 28 medals (2 gold, 5 silver and 21 bronze) in science.

The Philippine Team winners during the Awarding Ceremonies held in Naga City on Sept. 5, 2011 with their coaches & local officials.

MENTORING AND OTHER PROMOTION PROGRAMS

2011 Marine Science Camp. "From the Shore to the Seas: Exploring Further than You Can See" was the theme of the 2011 Science Camp. It was conducted on 28 April to 02 May 2011 in cooperation with the UP Marine Science Institute (MSI). Dr. Aletta T. Yniguez of UP-MSI served as Camp Director. In attendance were 60 students and teachers coming from selected Philippine Science High School campuses and science-oriented high schools in Regions 1, 2, 3 and CAR.

Students and teachers in one of their field activities on Waves and Tides during the Marine Science Camp in Bolinao, Pangasinan.

The Science Camp featured highly interactive, laboratory-based activities tailored to students with interests in Biology. Participants were students entering their junior or senior levels in high school with exceptional academic achievement and genuine interest in science, and those that have ongoing research study or planning to conduct one.

The Marine Science Camp was held at the UP Marine Science Laboratory in Bolinao, Pangasinan, and featured activities such as lectures, laboratory experiments, fieldworks and exposure trips. The major topics discussed included general knowledge on Marine Science (Physics, Geology, Chemistry, Biology), Scientific Methodology, Sea Safety and Survival, and Knots and Rope Management. Students were paired with experts/scientists throughout the Camp and were divided into six groups for their field activities that included Navigation, Waves and Tides, Marine Geology, Water Quality Sampling, Plankton Enumeration and Snorkeling.

The participants were also treated to a one-day exposure trip on marine resources like Coral Reef, Giant Clams and capped by a Community Survey. They also had night activities such as Lecture on Astronomy, Mobile Planetarium Show and Stargazing conducted by DOST-PAGASA staff, Data Visualization and Report, Film Showing, and Fellowship Night.

The Closing Program was held on 02 May 2011 at UP MSI Laboratory where the participants received their Certificates of Participation. Dr. Leticia V. Catris, Officer-in-Charge of SEI, delivered a message while Camp Director Dr. Yniguez gave the Closing Remarks.

Science Explorer. Much like the MITC buses that bring IT-based methods of learning and instruction to students in far-

Students tryout an experiment in the Science Explorer

flung areas of the country, the Science Explorer continues to bring fun and interactive science learning through hands-on activities inside a bus, which is brought to schools that lack laboratory facilities and other science resources.

The first roadtrip for 2011 of the Science Explorer was in Pilillia, Rizal upon the invitation of the Pilillia National High School where it was well received by the students and was nationally covered by GMA-7 Saksi. Afterwards, the mobile science learning facility visited Manila upon the invitation of the Philippine Normal University Physics Department for its anniversary celebration.

The Science Explorer was also featured twice in the ABS-CBN top-rating morning show Umagang Kay Ganda, as it brought fun-filled learning to students in Quezon City.

For its first provincial roadtrip of the year, the Science Explorer went to Ilocos Norte upon the invitation of its Governor, Hon. Imee Marcos. It was able to serve 355 elementary and high school students from Bacarra, Laoag City and Batac. This was followed in July by a trip to Dagupan City upon the invitation of Vice Mayor Belen Fernandez during their "Discovery in Science" event. Despite the heavy rains and flooding in the city, the Science Explorer's visit was well-attended by 645 elementary and high school students.

The Science Explorer was an instant hit as it went up to the Mountain Province, serving five municipalities which participated in the Science Film Festival to the Cordillera region. This was made possible through the partnership with Goethe Institut Manila and ABS-CBN Foundation, Inc.

Capping the Science Explorer's roadtrip was the journey to Benguet province upon the request of the DOST-CAR office. The facility was able to serve the students of La Trinidad and Baguio City.

Finally new modules were developed during the year in review covering topics such as Biotechnology, Robotics, Fun Mathematics for elementary and high school, Biodiversity, and The Pine Tree.

2011 Roadtrip Log of the Science Explorer		
Region	**Number of Schools**	**Number of Students served**
Ilocos Norte	12	355
Benguet	28	402
Mountain Province	72	713
Pangasinan	36	645
Rizal	2	211
Metro Manila	2	76
TOTAL	152	2402

Philippine Space Education Program.

2011 World Space Week Celebration.
The program covers the celebration of the 2011 World Space Week with the theme "50 Years of Human Spaceflight." It was conducted on 4-6 October 2011 at the Stadia, CSI Mall, Dagupan City as a major event of the Children's Congress. DOST-SEI organized and implemented the event in partnership with CSI Group of Companies headed by Dagupan City Vice Mayor Belen Fernandez, CEO of CSI, and with the Dagupan City Division of the Department of Education.

The celebration was composed of the following activities: Robotics Exhibition, Astronomy Exhibit and Mobile Planetarium Show, Forum for Students on Space Exploration, Forum for Teachers on Robotics Education, Training Workshop for Students on Water Rocket Making Design and Lecture-Demonstration on Water Rocket Making for Elementary Students, On-the-Spot Poster Making Contest, National Water Rocket Competition, and Star-Gazing.

The winners in the Poster Making Contest were as follows: 1st prize – Elijah Duran (Pascuala G. Villamil Elementary School); 2nd prize – Jeoffrey Cruz (Bolosan Elementary School); and 3rd prize – Vladimir Andrea Lugo (Wonderland School). The winners received cash prizes and certificates from DOST-SEI.

Meanwhile, the team from the Philippine Science High School-CAR Campus composed of Louie Sandro, John Jester Zeus Castro and Lorenzo Miguel Gonzales won the National Water Rocket Competition. DOST-SEI awarded the winners with P10,000 cash prize and certificates while CSI Group of Companies CEO and Vice Mayor Fernandez gave P5,000 to each of the students as support to their participation in the Asia Pacific Regional Space Agency Forum-18 (APRSAF) Water Rocket Event in Singapore.

The three-day event drew about 1,900 students, teachers and general audiences, along with representatives from the local newspapers, radio stations and regional TV networks.

Philippine participation in the Asia-Pacific Regional Space Agency Forum-18 (APRSAF) Water Rocket Event (WRE).
DOST-SEI conducted a training program on water rocket on 25-26 November 2011 at the Philippine Science High School-Cordillera Administrative Region (PSHS-CAR) Campus in Baguio City as part of the preparation of the Philippine team to their participation in the APRSAF-18 WRE.

The Philippine team was composed of Louie Sandro, John Jester Zeus Castro and Lorenzo Miguel Gonzales, students of Philippine Science High School-CAR Campus with Engr. Lorenzo Banda of the Philippine Foundation for Science and Technology (PFST) and Ms. Angelli Cortez of DOST-SEI as team leader and coach/instructor, respectively. The Water Rocket Event was held at the Raffles Institute, Singapore on 3-4 December 2011.

Submission of Philippine Poster Entries in the Asia-Pacific Regional Space Agency Forum-18 (APRSAF) Poster Making Contest
The Philippines submitted three poster entries in the APRSAF-18 Poster Making Contest that won in the On-the-Spot Poster Making Contest during the 2011 World Space Week Celebration. The Contest was held during the APRSAF-18 at Singapore on December 6-7, 2011.

Mathematics Olympiad Summer Training. The 20 high school students who made it to the National Stage of the 14th PMO underwent the special training jointly conducted by the DOST-SEI and the MSP held at UP Diliman and Ateneo de Manila University in Quezon City from April to June 2011.

The training, which exposed the students to rigorous exercises that simulated the problems given in the IMO, was conducted in four phases:
Phase 1: Correspondence format. The minds of the students were psychologically conditioned on the type of problems taken during the rest of the training.
Phase 2: Also done in correspondence format, this was conducted in one week using training materials based on concepts that are usually taken in higher mathematics.
Phase 3: Conducted in a lecture format, this phase was undertaken in four weeks, exposing students to the basics of problem-solving techniques, with examinations given at the end of each week.
Phase 4: Undertaken every Saturday of June, with another examination given at the end of training.

RECOGNITION PROGRAMS

Youth Excellence in Science (YES) Award. The YES Award is the DOST Institutional Award honoring the exemplary achievements of the youth in the fields of science and mathematics. Medals of Distinction are awarded by the DOST Secretary or the DOST Regional Director toward the end of each year. Specifically, these are conferred to winners of international competitions that have been duly registered with DOST-SEI by their national organizers.

A total of 259 students were awarded YES medals in 2011 – comprising 157 awardees from NCR and 102 from the regions.

Gawad LIDER. The Gawad Leadership and Innovations for Development Relevant to Science Education (Gawad LIDER) is a biennial award given to individuals or groups with sustained exemplary leadership in the field of science education and to those that developed and introduced innovations using science to improve science education.

The 3rd Gawad LIDER Award implemented in 2011 was highlighted by the reconstitution of the National Steering Committee which consists of seven (7) members from DOST, SEI, CHED, DepEd, UP Diliman, DLSU, and ADMU. The committee provides directions in the formulation/reformulation of policy guidelines for the project, selects the members of the Board of Judges, and approves the Board's recommendation. The committee also made the following minor revisions in the Guidelines and Criteria for Selection: a) addition of one (1) winner in the Innovation award while splitting the cash prizes from P200,000 to P100,000 per winner; b) setting of timeline of activities up to year 2012; and c) setting the deadline for submission of entries.

3rd Gawad LIDER National Steering Committee meeting @ Traders Hotel

The National Secretariat took charge of the development, production and dissemination of promotional materials such as posters and brochures to all regions, government offices and agencies, and higher education institutions. It also led in the posting of the announcement in one (1) major daily newspaper, the Philippine Star, and one (1) tabloid newspaper, Bandera.

The Awards were set to be conferred during the celebration of the 2012 National Science & Technology Week (NSTW) in July.

Strategic Communication for the Promotion of S&T HRD, Science Education, Innovation and Youth Science Programs. The Strategic Communication Plan of the Science Education Institute captures the entire gamut of communication strategies employed by the Institute to reach its target audience. It seeks to reinforce DOST-SEI's image as the institution for S&T Human Resource Development in the country and rally its audience to take part in fulfilling its mandate of creating a pool of future scientists and engineers.

To implement this plan, DOST-SEI utilized varied and appropriate media channels, such as print, broadcast and social media to connect with its diverse audience. For the year in review, DOST-SEI was able to create and farm out 24 press releases that resulted in 164 placements in print and online media. The Institute was also featured in broadcast media through TV and radio interviews.

DOST-SEI was also able to establish its official facebook and twitter accounts, enabling it to reach further to its audience. As of 31 December 2011, the DOST-SEI official facebook fanpage (*http://www.facebook.com/DOST-SEI*) has 648 likes while its twitter account (*@dost_sei*) has 37 followers.

Two other facebook fanpages for DOST-SEI's programs were also created: the Tagisang Robotics fanpage (*http://www.facebook.com/tagisangrobotics*) has 7,430 likes while the Science Explorer (*http://www.facebook.com/scienceexplorer*) has 88 likes towards the end of the year in review.

DOST-SEI also led and participated in different exhibitions, both national and regional in nature. The Institute organized and participated in a robotics exhibition during the Children's Congress in Dagupan City, and took part as well in the 2011 National Science and Technology Week, the DOST-CAR Regional Invention Competition and Exhibition, and the Science Discovery Tour.

CREATING COMMUNICATION AND INFORMATION LINKS

KEEPING THE PUBLIC constantly informed and in touch is a compulsory service for an agency as vital as the Science Education Institute, because so much of our tomorrow rely on our capabilities to meet the needs of today. As proponents of quality science education in the country, we must espouse quality resources that put to the fore our commitment to innovation through on-demand sharing of information and resources. Simply put, we cannot afford to be offline in this day and age.

This view is also in keeping with one of the government's agenda for national development, that is, to ease the delivery of government and social information and services to the public and to promote transparency in governance through the use of communication and information technology. In our field, digital technologies are indispensable tools that provide rapid feedback and foster student appreciation, interest and learning.

ACCESSIBILITY AND ACTION

Management Information System (MIS). During the year in review, DOST-SEI made several enhancements to its network infrastructure. The e-Meralco Ventures, Inc. (e-MVI) was tapped to provide six (6) mbps internet connection that is fast and stable. Uninterrupted Power Supply (UPS) units were acquired to energize the servers and switches even during power outages, providing continuous access to the DOST-SEI website. A proxy server was put in place to maximize the efficiency of network traffic, while an Active Directory server was installed to give the staff secure and efficient sharing of ICT resources. A DCHP server was also installed to automate the allocation of IP addresses for all the workstations and devices that will connect to the network. Likewise, a File Server that allows the staff to back up important electronic files was incorporated into the network infrastructure.

During the same year, the DOST-Advanced Science and Technology Institute (DOST-ASTI) implemented the fiber-optic connection within the Bicutan compound. A Virtual Local Area Network (VLAN) switch and optical cables were installed at the SEI server room to give the Agency an IPV6 connection to DOST-ASTI's PREGINET. To augment this, DOST-ITD also installed wireless access point to give wireless devices around the Science Heritage building access to Internet.

The MIS unit continued to administer ***www.sei.dost.gov.ph***, the agency's corporate website; ***www.tagisangrobotics.ph***, the portal of the Tagisang Robotics project that enhances the capabilities of high school students in robotics; and ***www.science-scholarships.ph***, the portal of the scholarship program of the agency.

The MIS personnel also attended the following trainings to upgrade their skills and competence: Advance Optic Fiber and Wireless Network Technology Training; Setting Up of the Unified Threat Management (UTM) Machine and Other Network Services Training; IPV6 for Beginners Training; and Linux Professional Institute Level 1 Training, among others.

The MIS staff were also involved in various committees inside and outside of the Institute's network. This includes membership to the Webmasters' Consortium of the eDOST-INFOSYS and the Network Management Group of the eDOST-INFRA for the DOST-wide activities. The MIS personnel were also part of the SEI's Inspection Committee that implemented the inspection process of all the purchases of the Institute.

FY 2011 FINANCIAL REPORT

Statement of Allotment and Obligations

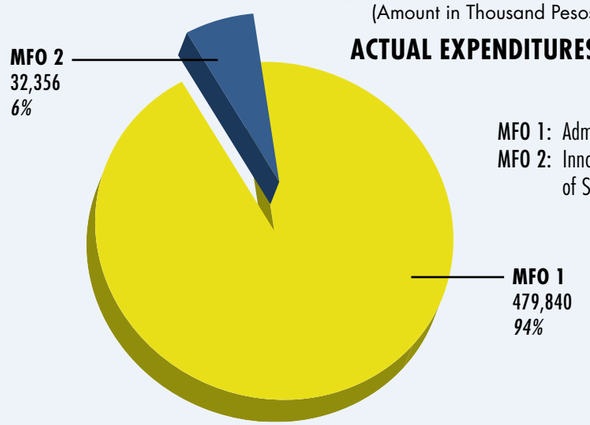
(P'000)

PAPs	PS		MOOE		CO		TOTAL	
	Allotment	Obligation	Allotment	Obligation	Allotment	Obligation	Allotment	Obligation
1) General Administration and Support Services	15,615	15,615	7,454	6,977	990	990	24,059	23,582
2) Operations								
• Development, Utilization and Implementation of Science and Technology Scholarships	2,376	2,376	455,398	455,297	-	-	457,774	457,673
• Science Culture Development and Promotion	3,327	3,327	3,785	3,121	-	-	7,112	6,448
• Research, Innovations and Training of Science Education	3,047	3,047	25,035	21,446	-	-	28,082	24,493
TOTAL	24,365	24,365	491,672	486,841	990	990	517,027	512,196

Budget Distribution Per MFO

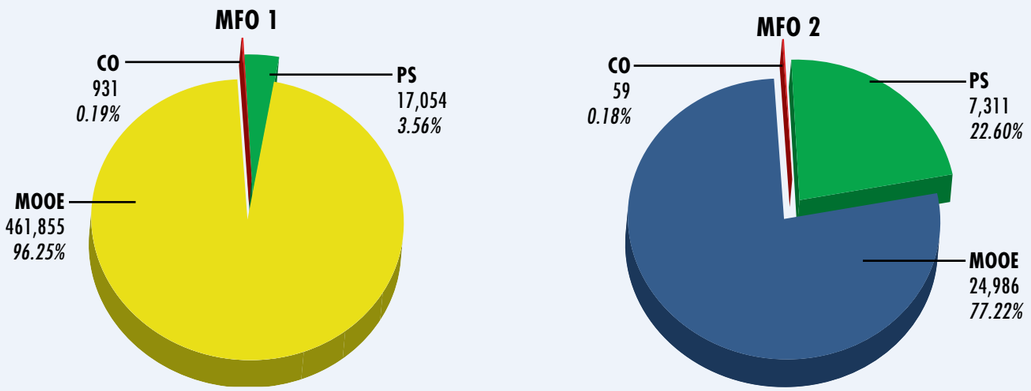
(Amount in Thousand Pesos)

ACTUAL EXPENDITURES



MFO 1: Administration of S&T Scholarship Program
MFO 2: Innovations, Research, Promotion and Development of Science Education and Culture Promotion Programs

PER MAJOR EXPENSE CLASS AND MAJOR FINAL OUTPUT



LOGICAL FRAMEWORK

SOCIETAL GOAL
Sustainable Economic Growth Towards Poverty Reduction

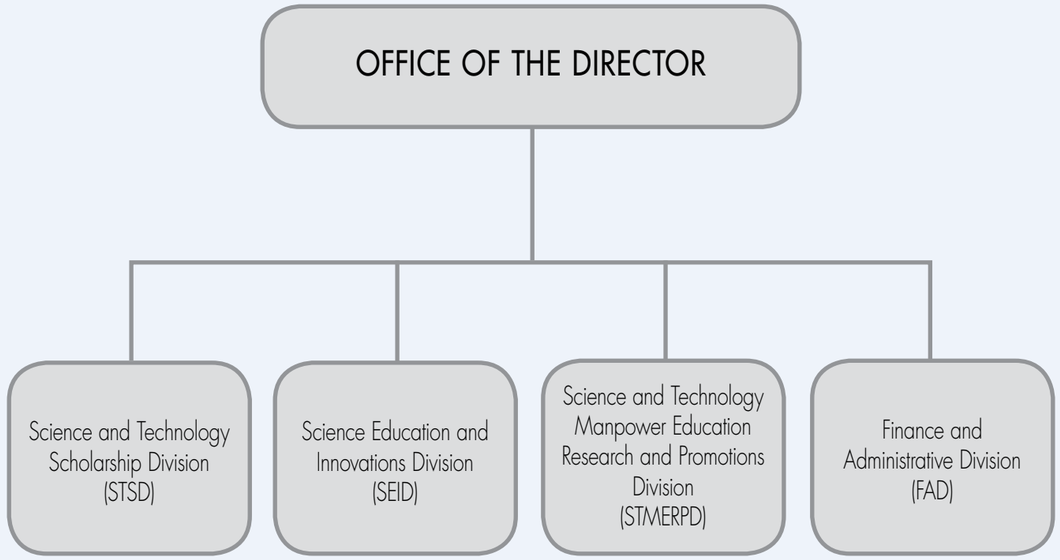
SECTORAL GOAL
S&T Productivity, Innovation, and Job Creation

ORGANIZATIONAL OUTCOME
S&T Human Resource Developed

MAJOR FINAL OUTPUTS

MFO 1: Administration of S&T Scholarship Programs	MFO 2: Innovations, Research, Promotion and Development of Science Education and Culture Programs
PAPs	
• General Administration and Support Services • Development, Utilization and Implementation of the Science and Technology Scholarships	• General Administration and Support Services • Science Culture Development and Promotion • Research, Innovations and Training in Science Education
PERFORMANCE INDICATORS	
• Number of scholars supported - Undergraduate Program - Graduate Program • Number of scholars monitored/tracked	• Number of trainees/participants/beneficiaries • Number of modules developed/digitized • Number of Mobile IT classroom deployed • Number of science education databases developed/maintained • Number of studies/researches conducted/assisted • Number of science and mathematics competitions conducted/ assisted/participated

ORGANIZATIONAL CHART



Key Officials of SEI

Filma G. Brawner, Ph.D.
Director

Leticia V. Catris, Ph.D.
Deputy Director

Alice L. Asuncion, MPM
Division Chief
Science and Technology Scholarship Division

Lilia R. Lauron, MAT
Division Chief
Science Education and Innovations Division

Ruby R. Cristobal, MPS
Division Chief
Science and Technology Manpower Education Research and Promotions Division

Aida T. Ayran, MBM
Division Chief
Finance and Administrative Division

OFFICERS AND STAFF

MANDATE

To develop a critical mass of highly trained science and Technology (S&T) manpower by administering scholarships, awards and grants in S&T, and formulating and implementing plans for the promotion, development and improvement of science and technology education and training. SEI spearheads the direct investment in scientific training through the implementation of programs and projects to address the increasing S&T manpower requirements of the country for economic development.

VISION

By 2020 and beyond, SEI shall have developed the Philippines' human resource capability in science and technology required to produce demand-driven outputs that meet global standards.

MISSION

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

PERFORMANCE PLEDGE

We, the employees of the Science Education Institute (SEI)
commit to:
Serve our clients promptly and efficiently;
Excellently perform our duty; and consider our clients as
Important as we are.

2011 ANNUAL REPORT

Science Education Institute

1F/2F Science Heritage Building
DOST Compound
General Santos Ave., Bicutan
Taguig City