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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.
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. Moreover, 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 as far 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.

MESSAGES FROM THE
Secretary

Department of Science and Technology

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 be 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.

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A UNESCO STATEMENT on the importance of science education for all sums up DOST-SEI’s own manifesto on its scholarship programs: “Indeed, science and mathematics education that is relevant and of quality can develop critical 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, 931 were continuing with 225 newly accepted, and 195 graduated. In the Doctoral Program, 240 were continuing scholars with 46 new ones and 30 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.

### Various Scholarship-Related Programs Implemented and Managed

**Presentation of the 2nd 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 Pena gave inspirational messages.

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

**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 and 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 percent (23%) graduated with honors; 17 summa cum laude, 81 magna 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, 225 cum laude, 3 honorable mention, 9 academic awards, and 3 with honors. Six (6) scholars completed their scholarship programs. Of this total, 338 or twenty-three percent (23%) graduated with honors; 17 summa cum laude, 81 magna 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.

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 turn out is higher by 17.75 percent compared to 2011 examination.

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, Sultan 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 in terms of trained personnel in S&T. To increase the number of qualified scholars, the new bill proposes to consider the grades in terms of trained personnel in S&T. To increase the number of qualified scholars, the new bill proposes to consider the grades in terms of trained personnel in S&T. To increase the number of qualified scholars, the new bill proposes to consider the grades in terms of trained personnel in S&T. To increase the number of qualified scholars, the new bill proposes to consider the grades in terms of trained personnel in S&T.

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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.

As 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:

1. Mr. Nino A. Relos
   - Senior Weather Specialist
   - Research and Development and Training Division
   - PAGASA
   - “Cover or Run? Getting Ready for Natural Disasters (Typhoon)”

2. Ms. Marlene H. Villagigas
   - Chief
   - Geologic Disaster Awareness and Preparedness Division
   - PHIVOLCS
   - “Cover or Run? Getting Ready for Natural Disasters (Earthquake)”

3. Dr. Ma. Lourdes Q. Moreno
   - Science Research Specialist II
   - Ecosystems Research and Development Bureau
   - DENR
   - “Biodiversity and You: Exploring the Wonders of Nature”

4. 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 Kolambogon Central Elementary School, Lanao del Norte;
2. Vince Robert P. Arboleda of Nuro Central Elementary School, Maguindanao II.
3. Sayed Khatami Sultan Abdoulpoor of Anai Pakpok
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 727 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.

b. Summer Immersion Program.
Summer Immersion Program.
a. the activities conducted throughout the year in review:
array of activities was undertaken under this project in 2011. By
Competitiveness in Science Education.
Capacity Building and Developing Global
Science Education Institute
46th Annual BIOTA Convention and Scientific Sessions
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.
Superconac 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
cost of transportation and workshop expenses as well as
research supplies to the ten (10) participants coming from
Mindanao State University Marawi, University 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 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 will 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 Gypsum Rasins
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.

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
chemistry to 20 high school Chemistry teachers
from the Department of Education, Division ofTaguig,
Pateros and Parañaque.
Microscale Chemistry works with small quantities of chemical
substances, in place of traditional chemistry teaching that centers on multi-glass preparation. 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 microscale 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 green 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. Atyane Mickey Sanzor, 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 Gural (Associate Professor, Department of
Science Education, Abi-Evran University, Turkey)
6. Dr. Wen Hua Cheng (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. Magessvary Karpjulawen (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 endorses 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,
Recreations 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 for secondary and post-secondary
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 from the National Capital Region.

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

1. Mr. Alva Benedict C. Balbuena (UP Diliman)
2. Dr. Julius M. Basco (UP Diliman)
3. Dr. Evangelina P. Bauan (ADMU)
5. Dr. Ian June L. Gracec (ADMU)
6. Mr. Karl Friedrich C. Alina (ADMU)
7. Dr. Job A. Noble (ADMU)
8. Dr. Arlene A. Pascasio (DLSU)
9. Dr. Eden Delight B. Provo (DLSU)
10. Dr. Judele F. Sarmiento (ADMU)
11. Mr. Eric F. Sy (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 school teachers with training, coursework, equipment and other related facilities for an introductory study of digital electronic 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 phenomena should one occur. It also sought to enhance scientific knowledge of teachers on natural disasters and climate change; and to communicate effective response to natural phenomenon should one occur. In the process, they also prepared Action Plans they intended to do after the training programs.

A similar training activity was held in Cebu City for 22 DEOST representatives from DOST agencies located in Cebu. The project also produced a Trainers’ Manual on DRRM to guide participants in conducting similar activities in their respective science classes. The participants also prepared their Action Plans they intended to do after the training programs.

On the first day, the keynote speaker, Prof. Chun-Yen Chang, Director of Science Education Development, 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:

- Mr. Karl Friedrich C. Alina (ADMU)
- Dr. Job A. Noble (ADMU)
- Dr. Arlene A. Pascasio (DLSU)
- Dr. Eden Delight B. Provo (DLSU)
- Dr. Judele F. Sarmiento (ADMU)
- Mr. Eric F. Sy (ADMU)

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 Cebu was also implemented.

The SEI Training Workshop on DRRM coincided with the National Disaster Preparedness Month with the theme “Makakayaan, Makakita. 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 Cebu were trained. The following were the resource persons and their respective topics:

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation and Office</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. Nelia Tabago</td>
<td>DRM Coordinator</td>
<td>The Philippine Disaster Risk Reduction and Management System</td>
</tr>
<tr>
<td>Dr. Charnanee Niland</td>
<td>Science Research Specialist II PHVOCIS-NIC</td>
<td>Earthquake and Earthquake Hazards</td>
</tr>
<tr>
<td>Mr. Jeryl Jesua</td>
<td>Weather Specialist II PHVOCIS</td>
<td>Weather Forecasting and Warning Services</td>
</tr>
<tr>
<td>Mr. Ray Buclin</td>
<td>Assistant Weather Services Chief PAGASA</td>
<td>Flood Forecasting and Warning Services</td>
</tr>
<tr>
<td>Mr. Raymond Rosales Arong</td>
<td>Science Research Specialist IV DENR and Mines and Geosciences Bureau (Main Office)</td>
<td>Rain-Induced Landslides and Hazard Mapping</td>
</tr>
<tr>
<td>Dr. Catherine Nicolas-Yu</td>
<td>Professor, School of Science and Engineering</td>
<td>Public Awareness of S&amp;M Education</td>
</tr>
<tr>
<td>Dr. Filma G. Brauwer</td>
<td>Director, Science Education Development Institute-DOST</td>
<td>わかかなやん, 家かくにん. サンダクアップのコラム名, 地震と地震被害, 地震と気象観測, 地震と海嘯防災, 地震と火山防災, 地震と気象学.</td>
</tr>
</tbody>
</table>
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 PC. 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 I | Panagbenga Central Elementary School
Region IV-A | Tanuan North Central School
Region VIII | A.T. Napo Central School
Region X | Koronadal Elementary School
NCR | Fourth Estate Elementary School

**Development of Interactive Courseware for Science and Mathematics for Secondary Level Schools (2nd Year HSS)**

This project was designed to develop Science and Mathematics e-learning modules for secondary level schools 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:

- **Activity 1:** How are the objects classified? (Mathematics)
- **Activity 2:** Finding the remarkable item/s (Mathematics)
- **Activity 3:** Finding the missing digit/s (Mathematics)
- **Activity 4:** Finding the missing addends/sum (Mathematics)
- **Activity 5:** Finding the missing number (Mathematics)
- **Activity 6:** Subtracting whole numbers (Mathematics)
- **Activity 7:** Finding the whole number (Mathematics)
- **Activity 8:** Finding the missing number (Mathematics)
- **Activity 9:** Finding the missing number (Mathematics)
- **Activity 10:** Finding the whole number (Mathematics)

**ANALYZING EARTHQUAKE WAVES AND COPING MECHANICS**

- **Activity 1:** Breaking the mystery of Earthquake Waves (Geology)
- **Activity 2:** Coping with Earthquake Waves (Geology)

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.
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 project, 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 3:**
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. Hypothesis testing
5. Chi Square Test

**MODULE 1:**
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 irreplaceable 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;
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 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 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 (1.6% 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 B.S courses under the RA Scholarship Program, followed by those who enrolled in Technical courses (20%).

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

At the time they accomplished the form, the scholar-graduates were already disaggregated by employed classification. 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.

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

Migration of S&T Manpower – Part II. OFWs. DOST-SEI completed in 2011 the second 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 (ISCO), 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, where the highest percentage of OFWs who left the country was recorded (see Figure 6).
• 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).

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) 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 mismatch between education and manpower requirement.**
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• 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 need for more information on OFWs.**
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**Fig. 7: Annual Flow of S&T OFWs by Sex, 1998-2009**

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

<table>
<thead>
<tr>
<th>Country</th>
<th>Average Rank</th>
<th>Frequency of Occurrence</th>
<th>Average No. of S&amp;T OFWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia (Middle East)</td>
<td>1.0</td>
<td>12</td>
<td>9466</td>
</tr>
<tr>
<td>United Arab Emirates (Middle East)</td>
<td>3.4</td>
<td>12</td>
<td>1089</td>
</tr>
<tr>
<td>United States (Americas)</td>
<td>4.5</td>
<td>12</td>
<td>581</td>
</tr>
<tr>
<td>Singapore (Asia)</td>
<td>5.0</td>
<td>12</td>
<td>522</td>
</tr>
<tr>
<td>Kuwait (Middle East)</td>
<td>6.2</td>
<td>11</td>
<td>356</td>
</tr>
<tr>
<td>Qatar (Middle East)</td>
<td>4.9</td>
<td>10</td>
<td>836</td>
</tr>
<tr>
<td>Libya (Africa)</td>
<td>7.5</td>
<td>10</td>
<td>282</td>
</tr>
<tr>
<td>Ireland (Europe)</td>
<td>6.4</td>
<td>7</td>
<td>527</td>
</tr>
<tr>
<td>United Kingdom (Europe)</td>
<td>2.4</td>
<td>7</td>
<td>2165</td>
</tr>
<tr>
<td>Bahrain (Middle East)</td>
<td>9.0</td>
<td>6</td>
<td>190</td>
</tr>
</tbody>
</table>
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 science, 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 that DOST-SEI’s programs and projects are achieving their objectives, a Monitoring and Evaluation of SEI Programs and Projects. The highlights of each report are as follows:

Science Explorer
- Elementary and high school students using this learning method showed positive improvement in their science learning.
- 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 the 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 comparing to male students.
- However, both sexes showed the least agreement for Statement 4: “Nagkarako 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 of 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 biology, basic anatomy, and chemistry. 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 viny 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) Framework for Philippine Science Teacher Education.

These publications are intended to enable policymakers, professional organizations, 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 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.
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.

The 10th PMO was implemented successfully in three (3) stages of competition with the participation of schools from all over the country.

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 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.

10th PRO winners & their coaches with SEI Director, Dr. Filma G. Brawner and FELTA Pres./CEO Ms. Mylene Abiva.

**Special Category**

**Robot Soccer** First Place Philippine Science High School (Bicol Campus)

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

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, inciting their desires to launch careers in engineering and technology.
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 Campus, participated in the competition. These are:

1. Bangkal High School
2. Benigno “Ninoy” Aquino High School
3. Caruhatan National High School
4. Caravathan National High School
5. Las Pitas Science High School
6. Makati Science High School
7. Manila Science High School
8. Muntinlupa Science High School
9. National Science High School
10. Pasyo 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. Yangson 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 Centre 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 3M 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, distributed on 28 July 2011 during the Game Reveal held at the Philippine Science Centre in Marikina City.

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.

Grace Christian College's Team Gracian 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. Yangson’s Colleges Inc’s Team DFTY Trojans, Rizal National Science High School’s Team R:11 Mekanismos and Grace Christian College’s Team Gracian 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 individual 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 Lybys won the National Instruments Best Engineering Award; Caloocan High School’s Team Mechanical High won the Felts’ Most Popular Robot Award and Alabang Most Popular Team Award; while the Muntinlupa Science High School’s Team MunSci Jailbreakers won the ThinkLab’s Best Blog Award.

A total of 3,442 students from Grade 3 up to second-year college were named among the 2011 AMC medalists:

1. Adrian Reginald Sy – St. Jude Catholic School
2. Jinger Chong – St. Jude Catholic School
4. Henry Jefferson Morco – Chiang Kai Shek College

The table below summarizes the results of the oral presentation:

<table>
<thead>
<tr>
<th>Award</th>
<th>Name of School</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best Project of the Year Award</td>
<td>Abroad University - Kag髇 City</td>
<td>Translating Words Through Synthetic Sign Language Avatar</td>
</tr>
<tr>
<td>1st Runner up/Silver</td>
<td>Muntinlupa Science High School Main Campus</td>
<td>Effects of Two Entomopathogenic Fungi, Beauveria bassiana and Metarhizium anisopliae, on Diamondback White (Plutella xylostella) Larvae under Varying Temperature</td>
</tr>
<tr>
<td>2nd Runner up/Gold</td>
<td>UST – San Carlos University</td>
<td>Certificate from BPI</td>
</tr>
<tr>
<td>3rd Runner up/Gold</td>
<td>UST – San Carlos University</td>
<td>Certificate from BPI</td>
</tr>
<tr>
<td>4th Runner up/Gold</td>
<td>UST – San Carlos University</td>
<td>Certificate from BPI</td>
</tr>
<tr>
<td>5th Runner up/Gold</td>
<td>UST – San Carlos University</td>
<td>Certificate from BPI</td>
</tr>
<tr>
<td>6th Runner up/Gold</td>
<td>UST – San Carlos University</td>
<td>Certificate from BPI</td>
</tr>
</tbody>
</table>

The 52nd IMO drew 564 school-contestants from 104 countries and territories, with each country delegation headed by a Team Leader and Deputy Team Leader. The five-man Philippines team was coached by Dr. Julius Basilio of UP Diliman and Team Leader Mr. Glenn 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 Antoniette 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 (IPO) make a courtesy call to President Benigno C. Aquino III on 23 August 2011 at Malacanang Palace. They were accompanied by DOST Secretary Mario G. Montoya, SEI Director Filma G. Brawner, Dr. Jose Perico H. Esquiva of PhO, Dr. Julius Basilio of IEO, and Ms. Arlita Naranjo and Mr. Ricky Bonao 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 administered by the non-profit Australian Mathematics Trust. A total of 3,442 students from Grade 3 up to second-year college took the AMC on 4 August 2011 nationwide, simultaneous with students from other participating countries like Australia, Bulgaria, China, Hong Kong, Malaysia, New Zealand, Singapore, South Korea, 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 among the 2011 AMC medalists:

1. Audrey Sy – St. Jude Catholic School
2. Jinger Chong – St. Jude Catholic School
3. Matthew Angel Ng – St. Jude Catholic School
4. Andrea Jaba – St. Jude Catholic School

Recipients of the AMC Prize Award, given to those who made 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 Angel Ng – St. Jude Catholic School
4. Andrea Jaba – St. Jude Catholic School
5. Miguel Lorenzo Ibañez – Pasay-Westbridge School, Inc.
6. Andrew Lawrence Sy – Xavier School
7. Sterling Alvin Tu – St. Stephen’s High School
Sixty (60) other students garnered High Distinction certificates for being in the top two percent of examinees in their year level while ten students received Prodecence Awards.

The awarding ceremony was held on 31 October 2011 at Century Seafood Restaurant, Century Park Hotel, Manila graced by AMT Executive Director Prof. J. Taylor, Hon. Byrne, SEI Director Dr. Filma G. Brawner, and MTG President Dr. Simon L. Chua.

The Philippine delegates came from the following schools:

**Elementary Level – Regular Category**
1. Grace Christian College
2. Comembo Elementary School
3. 1st Tibetian Elementary School
4. 2. Dr. Yanga’s College
5. Grace Christian College

**High School Level – Regular Category**
1. Grace Christian College
2. First Asia Institute of Technology & Humanities
3. International School Manila
4. Dr. Yanga’s College
5. Grace Christian College

**Robot Soccer**
Philippine Science HS – Bicol Region Campus

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

<table>
<thead>
<tr>
<th>Awards</th>
<th>Category</th>
<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Technical Award</td>
<td>Open-High School</td>
<td>Dr. Yanga’s College</td>
</tr>
<tr>
<td>4th Place</td>
<td>Open-High School</td>
<td>Dr. Yanga’s College</td>
</tr>
<tr>
<td>1st Place</td>
<td>Open-High School</td>
<td>International School of Manila</td>
</tr>
<tr>
<td>3rd Place</td>
<td>Regular-High School</td>
<td>Pisae – Bicol Region Campus</td>
</tr>
</tbody>
</table>

The 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 IMSO 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 (2 gold, 5 silver and 21 bronze) in mathematics and another 28 medals (5 gold, 5 silver and 21 bronze) in science.

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 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 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. Imae Marcos. It was able to serve 355 elementary and high school students from Batac, Laoag City and Batac. This was followed in July by a trip to Dagupan City upon the invitation of Vice Mayor Balan 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.
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.


DOST-SEI conducted a training program on water rocket on 22-26 November 2011 at the Philippine Science High School- Cordillera Administrative Region (PHS-CAR) Campus in Baguio City as part of the preparation of the Philippine team to their participation in the APRSAF-18 WRE.

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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 DHCP 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.
Statement of Allotment and Obligations

<table>
<thead>
<tr>
<th>PAPs</th>
<th>P</th>
<th>MOOE</th>
<th>CO</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Allotment</td>
<td>Obligation</td>
<td>Allotment</td>
<td>Obligation</td>
</tr>
<tr>
<td>General Administration and Support Services</td>
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<td>15,615</td>
<td>7,454</td>
<td>6,977</td>
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<tr>
<td>Operations</td>
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<tr>
<td>Development, Utilization and Implementation of Science and Technology Scholarships</td>
<td>2,376</td>
<td>2,376</td>
<td>455,398</td>
<td>455,297</td>
</tr>
<tr>
<td>Science Culture Development and Promotion</td>
<td>3,047</td>
<td>3,047</td>
<td>3,876</td>
<td>3,121</td>
</tr>
<tr>
<td>Research, Innovations and Training of Science Education</td>
<td>3,047</td>
<td>3,047</td>
<td>32,535</td>
<td>21,446</td>
</tr>
<tr>
<td>TOTAL</td>
<td>24,365</td>
<td>24,365</td>
<td>491,672</td>
<td>486,841</td>
</tr>
</tbody>
</table>

Budget Distribution Per MFO
(Amount in Thousand Pesos)

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

Actual Expenditures

MFO 1: 479,840
94%

MFO 2: 32,356
6%

PER MAJOR EXPENSE CLASS AND MAJOR FINAL OUTPUT

MFO 1
- CO: 931
67.96%
- MOOE: 660,055
96.23%
- PS: 17,054
2.56%

MFO 2
- CO: 59
0.18%
- MOOE: 24,966
77.22%
- PS: 7,311
22.60%

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
- General Administration and Support Services
- Development, Utilization and Implementation of Science and Technology Scholarships

MFO 2: Innovations, Research, Promotion and Development of Science Education and Culture Programs
- 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
Key Officials of SEI

Filma G. Brawner, Ph.D.
Director

Leticia V. Catris, Ph.D.
Deputy Director

Alice L. Asuncion, M.P.M.
Division Chief
Science and Technology Scholarship Division

Science and Technology Scholarship Division (STSD)

Science Education and Innovations Division (SEID)

Science and Technology Manpower Education Research and Promotions Division (STMERPD)

Finance and Administrative Division (FAD)
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;

Effectively 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