



Science Education Institute



Unwavering Commitment to S&T  
Human Resources Development



About the Cover:

## The Keys to Our Development

*Innovation through technology, networking through collaboration, and intensified focus on scholarship—these are the keys that help the Science Education Institute perform its mandate of producing a scientifically and technologically literate citizenry and accelerating the development of S&T human resources needed for our socio-economic development.*

*Representing these keys to our S&T growth are the DOST-SEI e-cards that give our scholars greater electronic identification, payment convenience and security; the Engineering Research and Development for Technology (ERDT) Consortium, whose symbol emphasizes the need for multi-institutional cooperation and sharing of resources; and the Accelerated S&T Human Resources Development Program that ultimately paves the way for our students' professional growth and our nation's progress.*



**Science Education Institute**



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SEI ANNUAL REPORT 2009

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# Introduction

Myriad factors, chiefly economic in nature, continue to challenge the country's science education platform. The Philippines may have been spared from the most significant effects of the financial crisis that continue to plague the major regions of the world, but its effects, no matter how small, is still distressing for a third-world economy already reeling from poverty to begin with. The result of this added economic debacle on our shores is an even lowered capability for the population and for the government to allocate expenditure for education. And when even basic education is not met, what more the chance for a higher science education?

## The challenging economy

According to the 2006 Official Poverty Statistics Report by the National Statistical Coordination Board, poor Filipino families number 4.7 million, equivalent to 26.9% of the total number of Filipino families, marking an increase from 4 million poor families in 2003. Regrettably, the National Statistics Office (NSO) also announced that average family income in real terms declined in 2006 compared to three years before then.

When it comes to education, the NSO revealed a decrease in the spending share of education among poor families, from 2.9% of total family expenditure in 2003 to only 1.3% in 2006. This means that in 2006, the poor spent just half of what they spent for education in 2003, a pattern which, if left unchecked will have long-term implications on human capital and poverty reduction in the country.

With poor families spending more on food, fuel and utilities based on the 2006 NSO data, little is left for education. Parents are cutting on cost of tuition fees, books, school supplies, education materials and allowances, transferring their children from private to public schools, and allowing them to work and for longer hours to add to their meager income. Worse still, a growing number of children drop out of school due to the high cost of education.

Government spending also leaves much to be desired. For 2009, the Department of Education (DepEd) was allotted a P167.94 billion budget, the biggest among government agencies. Yet, based on the standards set by the United Nations Education Scientific and Cultural Organization (UNESCO), the budget remains at only 2.07-2.53% of the country's Gross Domestic Product (GDP), way below the international norm of 6%.

## Lack of Science Culture

Compounding the problem is the lack of a strong science culture in our educational and societal frameworks. Well over three decades have passed since we have identified the problems inherent in our socio-cultural makeup – a traditionalist society that downgrades curiosity and non-conformist ideas, a textbook-centered learning routine that persists from elementary to the tertiary level, and the general impression that science courses are difficult and science careers financially non-rewarding. The result is an ongoing very low percentage of students taking up science courses in the universities, and very low proportion of students getting into science teaching.

With low interest comes low performance. DepEd data show that the achievement rate of fourth year students in Math dropped from 50.70% in SY 2005-2006 to 47.82% in SY 2006-2007. The decline also happened in Science, from 39.49% to 37.98% in the same period.

The Trends in Mathematics and Science Study (TIMSS) in 2003 showed that the Philippines' 8th grade (2nd year high school) students' skills and competencies in Math ranked a pitiful 42nd out of 46 participating countries while the Philippine 4th grade students placed 23rd out of 25 participating countries.

The establishment of science-oriented high schools fails to curb the decreasing trend in interest in science-oriented education. While DepEd data showed that elementary achievement rate in Grade 6 Math and Science rose for school year 2006 compared to the previous year, the high school achievement rate in the same subjects declined. This is a clear manifestation of children's loss of interest in these areas as they move further in the academic ladder. In the tertiary level, less than half of the enrollees in the country are in S&T-related courses, with the number of graduates remaining at the minimum.

One critical factor in the improvement of science education in the country is the inadequate supply of qualified teachers to teach physics, chemistry, biology, and integrated science. Many of those who teach Math and Science in public schools are not Math and Science majors, but Education majors who lack expertise in the subjects.

## Single-minded commitment

Throughout all these challenges, SEI persists on its mandate with unwavering focus—to develop a critical mass of highly trained S&T professionals through scholarships, awards and grants. The country may still be far from attaining this critical turning point, but SEI's unyielding commitment stems from the inescapable need to harness our science and technology capability, develop our country's competitiveness, and improve our people's quality of life.

Together with our partners in the government, business and industry, academe and NGOs, we at SEI commit ourselves to intensify even more our S&T support programs, cognizant of the pressing aforementioned challenges and of meeting the Medium-Term Plan to develop a significant base of R&D-capable manpower. In addition to scholarships, S&T events and competitions, we continue to support in-service teacher-training programs, incentives and other forms of encouragement for top Filipino scientists and technicians, cross-country exchange programs and sharing of best practices, seminars, knowledge digitization and dissemination, academic networking and other linkages.

We are all aware of the importance of developing a large and diverse talent pool ready to take up the challenge of a career in science for the future strength of economies. Whether as a student, a scholar, an educator, an investor or a policy maker, we must all nurture this awareness and commit ourselves to action.



# Secretary

We entered the 51st year of the Department of Science and Technology in 2009 cognizant of the fact that it would be the last year we would serve under the Arroyo presidency. Under her administration, we have to give due recognition to her contributions that allowed huge developments to take place in our science and technology initiatives in the last four to five years.

Boosted by her declaration that "technology shall be the foundation of the development of the country," our resources have never been higher. From 2001 to 2009, government support to science and technology (S&T) had been recorded as highest in terms of funding and institutional support. Increased funding was at hand to push high impact projects, while significant laws and directives were enacted to translate the gains we have made into concrete benefits for the people.

This increased investments in S&T was directed towards improving our capacity in terms of human resources. Many areas that are vital for national development were not considered priorities in the past. The ratio of science and math teachers to students is still grossly disproportionate, while budgetary support for R&D continues to be erratic. Directives are in place that aim to strengthen our scholarship programs to double the country's engineers and scientists involved in research and development, while bigger funds are being sought to increase our budget for R&D activities from 0.43% to 1% of our Gross Domestic Product within the next few years.

Our R&D budget has already reached P3.6 billion, but this remains a paltry sum compared to Japan's 3.12% GPD allocation or Singapore's 2.15%. A look at Taiwan's R&D expenditure in 2004 alone – US\$14.9 billion – should give a better perspective of our status among our Asian neighbors. In terms of manpower, we have an average of only 125 engineers and scientists for every million population, whereas the standard for developing countries set by UNESCO should be an average of 380 per million population.

We hope that the gains made in the Arroyo administration will be taken up and nurtured by the new 2010 government. I have already made recommendations that the next DOST secretary must focus on information and communication technology (ICT), biotechnology and nanotechnology because these cut across many areas like health, agriculture, and environment. We must strengthen our partnership with the private sector and forge alliances with more foreign partners with whom we can share best practices to improve our S&T services. Our department plays a critical role in nation building, and the contributions of the Science Education Institute have proven to be invaluable towards this end.

The window is fast narrowing down for us to meet the Millennium Development Goals that we set for 2015 as member of the United Nations. Meeting these goals calls for creativity and innovation – the requisites for science and technology. We need to mobilize our S&T capability for sustainable development to take place, to eradicate hunger and disease, and to get our people out of poverty. Let the MDG be our guide, and let us act quickly and decisively.



**STRELLA F. ALABASTRO, Ph.D.**

Secretary

Department of Science and Technology



# Director

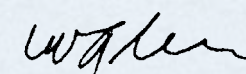
As if the challenges contained within our own education system were not enough, 2009 brought with it extraordinary circumstances that aggravated the situation particularly among our poor students. On top of the global economic crisis that, though sparingly, still made inroads in our country's economy, huge tropical storms battered the country with such severity that Filipinos finally awakened to the reality of climate change and the need for greater disaster preparedness, especially in the aftermath of typhoons *Ondoy* and *Pepeng*.

What did all this mean for Filipino students? Education is one of the paths to free oneself from poverty but poverty can also be a great hindrance to getting education. Time and again we have seen an optimistic number of scholars supported by our programs dwindle to a few who manage to graduate in a given year.

Nevertheless, though only a limited number of slots are made available each year because of insufficient government allocation, our confidence gets buoyed by the fact that we see an escalating number of applicants who pass our scholarship programs every year. There were 6,651 total number of scholars in 2007, followed by 8,330 in 2008, until finally it peaked to 9,026 in 2009. Our efforts to promote the importance of S&T education is bearing fruit as indicated by this data, and what we are seeing is a growing realization among the youth who come from lower economic status that having a high aptitude in science and mathematics can open for them great and lucrative careers in S&T.

"Focus" is the theme that we have adopted to communicate the gains we have achieved in 2009, and it reminds us to stay our course along positive lines instead of merely veering away to dwell on the negative aspects of our educational and scientific culture. We have certainly much to be thankful for: in addition to a growing number of scholars taking up S&T education, even among those pursuing their masters and doctorate degrees, we saw a dramatic rise in the number of Filipino students who excel in math and science and have the medals won from local and international competitions to show for it. On a national scope, the passing of House Bill 5208 or the Intellectual Property Bill should spur the filing of patents and trademarks as creators and innovators will be encouraged by improved access to technology and funds, stronger intellectual property rights, and a more robust movement towards commercialization to benefit the greater public.

These triumphs must be sustained, financed and disseminated on such a level as to ultimately achieve true scientific culture for our country. Achieving medals and honors in the sciences and recording scholarship capacities are commendable, surely, but in the long run they all must contribute towards the creation of a citizenry that has the ability to critically evaluate information, make informed decisions, and participate productively to attain progress. This ultimately is what should be the focus of all our efforts.



**ESTER B. OGENA, Ph.D.**

Director

Science Education Institute





# 2009 ACHIEVEMENT *Highlights*

## Gains in number of scholars

Undergraduate scholars supported under **RA 7687** peaked at 9,026 in 2009, an increase of 8.36% from 8,330 recorded in the previous year. The number of MERIT scholars likewise jumped by 32.80%, from 1,128 in 2008 to 1,498 in 2009.

The most significant increase was recorded in the **Engineering Research and Development for Technology (ERDT)**, which increased its number of MS and PhD scholars by 126% since its scholarship program was implemented in 2008.

Likewise, under the **Accelerated S&T Human Resources Development Program (ASTHRDP)**, SEI recorded its highest number of scholars with Masters and doctorate degrees, jumping by 57.30% and 68.15%, respectively, from 2008.

The number of DOST-SEI scholar-graduates who received top honors also increased by 21.63%, totaling 253 in 2009 from only 208 in the previous year. These numbers contribute to the acceleration in the production of high level S&T workforce brought about by SEI's escalated drive to promote the importance of S&T education. More youths consequently realize that there are lucrative and prolific careers in S&T once they hone their high aptitude in science, mathematics and related fields of study.

## Continuing Curriculum Development Initiatives

SEI continued its support to the DOST vision of inculcating science concepts to children as young as those in nursery and kindergarten level, beginning with those under the DOST Day Care. A **model teaching framework for pre-school**, pilot tested in 2008, was extended in 2009 for the continued training and mentorship of teachers and to determine the efficacy of the enhanced curriculum.

**Content Based Instruction** modules – 40 each for English and Filipino – were readied for digitization. These were infused with strong science and mathematics content to motivate students on learning these subjects on a more experiential level that also allows teachers to tailor activities based on the individual needs of their students.

SEI also supported the production of storybooks covering various science topics, called the **Pinoy Science Storybook series**. Eye-catching illustrations and lively texts aim to entice the youth to take up science and encourage the development of science culture in the country.

## S&T students shine internationally

The number of Filipino students who bagged international awards in science and mathematics competitions increased by almost 50 percent in 2009. In the **Philippine International Mathematics Competition**, the Filipino team emerged as champions

in individual and team contests, garnering 100 medals. In the **2009 Australian Mathematics Competition**, 14 students from 10 high schools nationwide bagged topped awards. Consequently, the Youth Excellence in Science (YES) awardees increased by 36% from 2008, with 297 winners in various international competitions – 191 from NCR and 107 from the regions.

SEI celebrated the **International Year of Astronomy** in 2009 and, together with the Philippine Foundation for Science & Technology (PFST) and UP National Institute for Science & Mathematics Education Development (UPNISMED), held workshops, demonstrations, and hands-on activities in support of this worldwide initiative of the International Astronomical Union and UNESCO.

Continuing the strong partnership with the private sector, the **BPI-DOST Best Project of the Year Awards** continues to draw the participation of some of the country's top research students, and identifies and gives support to the best science projects every year.

The **Philippine Robotics Olympiad** commemorated its 8th year with a 31% increase in the number of participants, proving that robotics is an enjoyable way of promoting S&T concepts among the youth. To raise students' interest even more in this field, SEI organized and launched a new initiative called **Tagisang Robotics: Design, Build and Play Competition**.

## Professional Development Activities

SEI funded a 5-day **Professional Development Program** aimed at teaching and encouraging physical science teachers on the use of the backward design model on their curriculum development. This model promotes the development of individual lesson plans to teach physical science subjects, instead of letting teachers rely on existing unit plans.

SEI supported the registration and accommodation of five foreign speakers invited to the **Asia-Pacific Conference on Chemistry Education**, a gathering of chemistry educators, researchers and students to discuss the technologies and advances in chemistry education. Concurrently held was the **24th Philippine Chemistry Congress**, the gathering of local counterparts in chemistry education.

SEI also sponsored and organized a **Lecture Series in Mathematics** to provide new learning techniques and capability for doing research studies in the teaching of science and mathematics for graduate scholars under the Accelerated S&T Human Resources Development Program (ASTHRDP).

SEI provided financial support to a training workshop towards the implementation of the **Framework for Mathematics Teacher Education**. This activity is meant to develop teachers' pedagogical knowledge in mathematics to enhance their teaching effectiveness, in light of several studies that pointed to their generally low competencies on Mathematical Pedagogical Knowledge (MPK) particularly among Filipino mathematics teachers.

Likewise, SEI gave its support to the **International Conference in Mathematics Education** aimed to update mathematics educators and specialists on the current trends and issues concerning mathematics education and research.

## Towards strengthening network readiness

STedNet portal and other local-based SEI servers started their migration into a more stable and web 2.0-ready platform in 2009. SEI also developed a new STCPD database and intra-blog site to host and manage the other databases of this division during the migration.



# Developing Human Resources in Science and Technology

New scholars line up before LBP personnel to apply for their DOST-SEI e-card, which functions as identification card and electronic access to their financial assistance released through the LBP.



*Tomorrow's science-based societies are already taking shape today, and they will increasingly depend on people who are both pushing the frontiers in science and taking a positive attitude to science as citizens. As the world continues to embrace ICT at a frenetic pace for competitive advantage and quality of life, the Science Education Institute (SEI) remains bullish in its mission of producing the kind of human resources needed by the global information economy.*

The following report bares the significant gains in this area, characterized in general by a noticeable increase in awareness of and interest by the intended clients in the Institute's scholarship offerings and other activities that enhance one's potential for a rewarding career in S&T.

## *Undergraduate Scholarship and Training Programs*

### **S&T Scholarship Examination**

In early 2009, the names of the 4,224 successful examinees in the 2009 S&T Scholarship Examination— comprising of 894 MERIT qualifiers and 3,330 RA 7687 qualifiers – were announced in three leading national newspapers and posted in the SEI website. Together with their parents, the new potential scholars attended the DOST-SEI Scholarship Orientation and Signing of the Scholarship Agreement in April.

These successful scholars received benefits that included tuition subsidy and book allowance per semester/term, monthly stipend, transportation allowance, and health insurance among others. The scholars enrolled at the University of the Philippines (UP) and other DOST-SEI identified institutions.

The 2010 S&T Scholarship Examination was conducted in 118 test centers nationwide on November 15, 2009. A total of 25,362 examinees took this qualifying test for college scholarships in priority science and technology courses. A rider for the selection of awardees for its own scholarship program, the Overseas Workers Welfare Association (OWWA) had 2,367 examinees.

### **RA 7687 Scholarship Program**

In 2009, the RA 7687 Scholarship Program supported 9,026 undergraduate scholars, an increase of 8.36% from the previous year's 8,330 total, and the highest in three years. This can be attributed to DOST-SEI's escalated drive to promote the value of S&T education as the way for poor families to make their way out of poverty. More youths coming from families within this lower economic stratum are realizing that their high aptitude in science and mathematics can lead them to lucrative and prolific careers in S&T.

As of end of AY 2008-2009, 872 or 9% of scholars graduated, 139 of which received honors while six completed their courses earlier than the prescribed period.





 Examinees of the 2010 S&T Scholarship Examination in Tacloban busily answer the test.

HONORS RECEIVED	NO. OF SCHOLARS
Summa cum laude	5
Magna cum laude	20
Cum laude	111
With honors	3

### MERIT Scholarship Program

The uptrend in the number of scholarship applicants is evident also for the MERIT Scholarship Program. In 2009, this program supported 1,546 scholars, a 39% increase from the previous year's figure of 1,109 and 69% more than in 2007 when there were only 914 scholars.

From 2009's total, however, only 109 or 7% graduated as of end of AY 2008-2009, with 48 of them graduating with the following honors:

For AY 2009-2010, 511 new scholars accepted the grant.

HONORS RECEIVED	NO. OF SCHOLARS
Magna cum laude	16
Cum laude	29
Honorable mention	3

### Junior Level Science Scholarships (Merit and GIFTS)

Open to qualified third year students enrolled in priority courses, this science and engineering scholarship program had 615 recipients in 2009. Under JLSS-Merit were 87 scholars, while JLSS-Project GIFTS (Government Initiative on Fellowships for the Talented in the Sciences for the Disadvantaged) had 528 scholars. Forty percent (40%) or 246 graduated as of end of AY 2009-2010. The program produced 57 honor graduates – nine *Magna cum laude*, 48 *Cum laude* and one Academic distinction.

### Project GREAT-M

The GREAT-M scholarship program, or the Grant for Educational Assistance on Technology Courses for Muslims, marked its 7th year of implementation by graduating 11 scholars in 2009, bringing to 49 the total number of scholars it has supported over the years. Three of these scholar-graduates in technology courses topped their classes with honors.

Thirty-two (32) scholars, meanwhile, continued their undergraduate studies at the Mindanao State University-Iligan Institute of Technology (MSU-IIT), MSU-Marawi City, Western Mindanao State University (WMSU) and the University of Southern Mindanao (USM)-Kabakan.

### BEST Program for IP

Tribal communities in various geographical areas are among the most impoverished and marginalized sectors of Philippine society. With the help of this groundbreaking program, known as the Bridging Education in Science and Technology for Indigenous People (BEST for IP), SEI aims to provide higher learning opportunities to those who have acquired secondary schooling and empower them to become more self-sufficient and engaging in their communities, using their S&T training to augment their indigenous knowledge.

At the inaugural offering of the program last year, 36 youths belonging to the IP sector availed themselves of the scholarship program out of 59 who qualified in the examinations, while five deferred their slots.

### Higher Learning Scholarship Programs

#### Accelerated S&T Human Resource Development Program (ASTHRDP)

As science and technology become increasingly sophisticated throughout the world, persons holding doctorate degrees will be able to obtain numerous opportunities to take part in international cooperative research activities, and their

roles will likewise take on increasing importance in the pursuit of research and development in the future.

In 2009, SEI experienced the highest recorded number of scholars supported and graduates with Masters and doctorate degrees. The number of MS and PhD scholars jumped by 59% and 81%, respectively, from 2008. Below is the breakdown of scholars:


COMPONENT	No. of scholars		No. of graduates	
	MS	PhD	MS	PhD
University-based	1,015	221	30	1
Thesis/Dissertation	65	34	11	5
Customized Residential Program	74	-	-	-
Foreign Scholarship (AIT*)	10	-	10	-
Research Enrichment (Sandwich) Program	1	1	-	-
SEI Industry Component	179	172	14	11

These numbers contribute to the acceleration in the production of high-level quality S&T workforce with Master's and PhD degrees in the government's priority S&T areas. In 2009, 65 MS scholars graduated with one obtaining cum laude honors, while 11 completed their PhD degrees.

The availability of the MS and PhD scholarships for AY 2009-2010 were announced in four leading national newspapers and were posted in the SEI website with links to the websites of the DOST Councils. The names of the qualifiers who successfully hurdled two levels of screening were also announced through the same media.

On April 1-2, 2009, a Student Conference on "Strengthening the Research Orientation of MS/PhD scholars of DOST in Mindanao" was conducted in Iligan City. Key personalities and resource speakers shared their insights on vital issues pertaining to the topic. In attendance were 132 scholars.

Cebu City and Cagayan de Oro City hosted on June 9 and June 20, respectively, the orientation and contract signing of the new graduate scholars who enrolled in the network universities in Visayas and Mindanao. Meanwhile, the Malacañang Palace hosted on July 8 the same activity for graduate scholars enrolled in NCR universities. President Gloria Macapagal-Arroyo congratulated and urged them to excel in S&T so that someday they will be "mighty names for R&D."

 President Gloria Macapagal-Arroyo (center), and (from left) DOST Sec. Estrella F. Alabastro with SEI Director Ester B. Ogena, are surrounded by DOST officials and ASTHRDP scholars during the orientation and signing of scholarship agreement at Malacañang Palace on July 8, 2009.



### ASTHRDP-Science Education

This program continues to produce scholars with doctoral degree in science education with majors in Physics, Chemistry, Biology and Mathematics. The 3-year grant aims to fast-track the increase in the number of competent educators, researchers and administrators in science education and competent teachers in the Teacher Education Institutions.

In 2009, the programs supported 49 scholars, 38 of whom were enrolled at the UP Open University in Los Baños, Laguna, six at De la Salle University, and five at the UP College of Education.

### I-PROGRESS

The graduate scholarship Program on Regional Opportunities for Graduate Science and Engineering (I-PROGRESS), launched in 2008, continued to provide support to poor but deserving six scholar-graduates – two MS and four PhD scholars – who have displayed high motivation for and interest in higher learning.

### ASTHRDP-Science Education Consortium

Among the 1,236 scholars under the Accelerated Science and Technology Human Resource Development Program (ASTHRDP), 123 were enrolled in the four universities that form the Science Education Consortium. This 8-year-old organization in the Visayas and Mindanao aims to catalyze the development of straight master/doctorate programs in science and mathematics education. The four institutions are West Visayas State University (WVSU) in Region VI, University of San Carlos (USC) in Region VII, Western Mindanao State University (WMSU) in Region IX and MSU-Marawi in the Autonomous Region of Muslim Mindanao (ARMM).

The table below shows the breakdown of scholars per institution:



TRAINING INSTITUTION	NO. OF SCHOLARS
USC	46
WVSU	49
MSU-Marawi	11
DLSU	11
MSU-IIT	3
WMSU	3

In 2009, the consortium produced seven new PhDs in various areas of science education.

### Engineering Research and Development for Technology (ERDT)

The ERDT Consortium Universities, which provides graduate scholarships in priority engineering courses and related fields, supported 374 MS and 66 PhD scholars in 2009. This represents a significant increase of 293% since the consortium’s scholarship program was implemented in 2008. Eighteen (18) of these scholars graduated within the period in review.

The ERDT aims to attain a critical mass of MS and PhD graduates in the various fields of engineering. It also aims to advance the qualifications of the engineers, upgrade engineering colleges, develop R&D culture among engineers and implement the research agenda aligned with the National Science and Technology Plan (NSTP) and Medium Term Philippine Development Plan (MTPDP).

The consortium consists of the Ateneo de Manila University, Central Luzon State University, De La Salle University, Mapua Institute of Technology, Mindanao State University-Iligan Institute of Technology, UP Diliman and the University of San Carlos.



Senator Edgardo Angara (3rd from left), keynote speaker during the “In Touch with Excellence” recognition rites, congratulates a scholar as DOST Secretary Dr. Estrella F. Alabastro (left) and SEI Director Dr. Ester B. Ogena (right) look on.

### Other Programs

The program *Cooperative Pre-Service Education for Science and Mathematics Teachers (Project 8102 Ed.)* supported 16 on-going scholars who would do their Summer Enrichment Program and off-campus teaching exposure at the S&T oriented high schools nationwide.

The *University of San Carlos (USC) Cooperative (Project 2004-Ed)* supported 98 scholars enrolled in BS Physics. At the end of AY 2008-2009, 13 scholars graduated with three garnering cum laude honors.

### Related Activities

#### In Touch with Excellence

Just as the turnout of S&T scholarship applicants was good in 2009, so too was the harvest of outstanding DOST-SEI scholar-graduates who received top honors in their respective schools/universities. There were five *summa cum laude*, 48 magna cum laude, 186 *cum laude* and 10 with honors or distinctions of academic excellence, for a total of 249 scholars who graduated with honors, an increase of 329% from 2008 when only 58 outstanding scholar-graduates were produced.

The honorees were acclaimed during the **2009 In Touch with Excellence** annual recognition rites held at the Grand Ballroom of the Dusit Thani Hotel in Makati City last July 16, 2009. Also honored were MS and PhD graduates of the ASTHRDP and other DOST graduate scholarship programs for their accomplishments.

Keynote speaker Hon. Sen. Edgardo Angara, Chairman of the Congressional Committee on Science and Technology and Engineering (COMSTE), challenged them all to create a “Filipino Brand” in the fields of electronics and communications technologies. He also informed them that it is not enough for the country to develop a pool of engineers, science graduates and other S&T professionals; it must ensure that the quality of these specialists must meet international standards to gain recognition and compete in the world market. Sen. Angara expressed his faith in the vast human potential available in the country but pointed out the stark truth that a lot of work has to be done, and programs like *In Touch with Excellence* are “significant steps in the right direction.”



### APEC Forum: Best Practices on HR Capability Building

SEI organized this forum aimed to provide an exchange of experiences on developing and improving the capacity of teacher education in science and mathematics through the sharing of best practices among APEC economies. This event also intended to provide the groundwork for building a research network in the teaching and learning of science and mathematics among these member countries.

Participants included 50 local and foreign experts from Australia, South Korea, Hong Kong, Thailand, Malaysia, Singapore, Indonesia and the United States. Nine (9) were foreign delegates while 8 were local speakers tasked to deliver talks on the following topics:

- Ethnoscience and Ethnomathematics
- Cross-Cultural Comparison of Students
- ICT in Teacher Education
- Professional Development of Teachers, Educators & Leaders in Science and Mathematics Education
- Developing Institutional Capabilities on Research in Science and Mathematics for Teacher Education
- Developing Capabilities in Science and Mathematics Education
- Assessment in Teacher Education for Science and Mathematics
- Capability Building in Science and Mathematics for Teacher Education

**Top:** from L-R: Dr. Ester B. Ogena (Director, SEI), Dr. Estrella F. Alabastro (Secretary, DOST), Dr. Young Hwan Kim (Coordinator, APEC-EDNET) and Dr. Fe A. Hidalgo (Chairperson, CHED TPTE).

Philippine Participants showcase the country's national costume during the Cultural Night.

Experts from APEC economies (Australia, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Thailand and United States) converge for the sharing of Best Practices on Human Resource Capacity Building in Science and Mathematics Teacher Education.





Twelve (12) other participants, composed of Deans or Faculty Members of higher education institutions from the Visayas-Mindanao Science Consortium that conduct research in science and mathematics education, came as Forum Observers. The rest were DOST personnel and other guests.

Held on November 9-10, 2009 at the Renaissance Hotel, Makati City, this event presented 17 scientific papers and saw two linkages established for teaching and learning science and mathematics in South Korea and Hong Kong. The forum also solicited the commitment of the participants to work towards collaborating and establishing a research network in the teaching and learning of science and mathematics among the APEC nations.

S&T Learning Assistance Programs

**2009 Job Hunting Strategies Seminar.** Sixty (60) DOST-SEI scholar-graduates from NCR and neighboring Luzon regions attended the **2009 Job Hunting Strategies Seminar** held on June 10, 2009 at the DOST Executive Lounge. Complementing this one-day event was a job fair organized by the Department of Labor at the Luneta Park on June 12, in which the seminar participants and other interested DOST-SEI scholar-graduates also attended.

During the seminar, MERIT scholar-graduate Ms. Julie Anne C. Bautista, now a technologist at the Pilipinas Shell Petroleum Company, shared her job application experience

Job Hunting Strategies Seminar Resource persons and participants simulate a job interview to learn the do's and don'ts of the process.



and tips with the new graduates. Ms. Karen Joyce, Human Resource Manager of the Canon Information Technologies Philippines, Inc., informed them of the competencies companies look for in their people and gave them ideas on how the companies assess applicants.

Dr. Rosalinda de Mesa, Guidance Services Specialist of the UP Diliman Office of Counseling and Guidance, discussed topics on self-awareness, time management, total quality person, multiple intelligence, critical thinking skills, resume writing, job interview, psychological tests, body language, and other subjects that impact on one's preparations and process of job application.

**Summer Orientation and Enrichment Program (SOEP).** This month-long series of intensive lectures in English and Mathematics was attended by 2,214 freshman RA 7687 scholars in May 2009. Its aim was to level off the preparation of the scholars in these subjects before they immerse themselves in the college courses.

**Summer Practical Training.** In April and May, 2009, 543 incoming senior scholars underwent this 240-hour regimen touching their fields of specialization in various research institutions and private companies. Likewise, junior Physics and Chemistry Teaching scholars attended a **Summer Enrichment Program** at the UP National Institute of Science and Mathematics Education Development (UP-NISMED) on the same period.

**Beneficiaries Congress.** Along with other recipients of different government programs, the RA 7687 scholars participated in the "Beneficiaries Congress" held at the



Ninoy Aquino Stadium in Manila on Nov. 16, 2009. The event provided the participants an avenue to share their experiences and develop collective advocacy measures for sustainability and expansion of the pro-people government programs even beyond the term of the Arroyo administration.

**PhilAAS Career Planning Lecture.** SEI provided financial assistance as the co-sponsors of the Career Planning Lecture organized by the Philippine Association for the Advancement of Science (PhilAAS). Held on June 26, 2009 at the Thomas Aquinas Research Complex, UST, Manila and on July 23, 20-09 at the University of Northern Philippines (UNP) in Viga, Ilocos Sur, the lecture aimed to promote careers in science among junior and senior high school students. The Program presented the lives and works of successful scientists and engineers to serve as role models and provide inspiration for students to pursue careers in these fields. Fifty-six (56) high school students came from Metro Manila and its suburbs while 395 high school students came from Region 1.

Other Activities

**Reorientation meeting on Management and Implementation of the DOST-SEI Scholarship Programs.** To ensure the efficient administration of the various science scholarship programs in the regions, an annual reorientation meeting is conducted. In 2009, the meeting of the regional scholarship technical and project staff was held in Hotel Stotsenberg in Pampanga on March 5. The scholarship policies and guidelines were reviewed and new scholarship policies were discussed. Problematic areas in the operations were tackled and recommended actions were



A regional coordinator delivers a report on statistics and other scholarship issues encountered in the regional operations of the Science Scholarship Programs.

(Topmost): PhilAAs members discuss the publication of "Milestones in Philippine S&T".

deliberated on and realistic and doable measures were adopted for the improvement of the operations.

**A Book on Milestones in Philippine S&T.** SEI provided financial assistance to the Philippine Association for the Advancement of Science, Inc. (PhilAAS) to support the planned publication of a book called **Milestone in Philippine S&T**. This landmark volume will feature 60 Filipino scientists who have made great strides with their achievements. By showcasing their lives and successes, SEI and PhilAAS hope to inspire or influence the youth, particularly those in Grades 5 & 6 upwards, to choose any of the fields of S&T for their future professions.



# Enhancing Science and Technology Education by Improving the Teaching and Learning Environment



The refurbished MITC bus await deployment at the SEI grounds.

*Government support to the development of science and technology was recorded to be the highest in terms of funding and institutional reinforcement within the last decade. Projects and proposals that have high impact on our science research and technological capabilities were examined and executed through adequate budgetary allocation, legislation, and a dedicated national leadership.*

Such support perhaps needs to be tripled or even quadrupled in order for the country to be at par with its Asian neighbors, let alone the rest of the developed world. In the 2009 competitiveness rating among 57 countries, the Philippines emerged as second to the last in terms of health, S&T, education, and many other areas. Worst in particular was the pupil-teacher ratio in high school and elementary levels.

Significant reforms are being constantly and urgently instituted with the aim of strengthening in particular science and mathematics in basic education. SEI commits to act on policies being instituted, support the need for broader coordination among public and private institutions, and meet the demands of the industry and the R&D sectors for an adequate supply of S&T Human Resources by sustaining an environment conducive to the teaching and learning of science and mathematics.

## *Technology Assistance Programs*

### **MITC in the regions**

The Mobile Information Technology Classroom (MITC) is a project that involves the use of air-conditioned buses fully-equipped through SEI funding with computer facilities, multimedia equipment and other science-related educational materials in digital formats as an alternative method of learning and instruction. It aims to develop a science culture and technology-literate public, particularly elementary and high school students and S&T teachers, through the use of information technology.

The advent of cheaper computers and continuing spread of internet connectivity especially in urban areas has made the MITC more relevant to improving S&T education in



remote schools. Despite problems which include difficult road conditions, size of the bus, and the high cost of fuel and maintenance, the project continues to be an effective alternative delivery of, as well as a novel approach to promoting interactive learning of science and mathematics in disadvantaged schools.

Among the five buses under the MITC project, three were deployed in Camarines Sur, Siargao and Davao. In 2009, the bus deployed in Davao was pulled out for repairs due to several damages that included rusty surfaces, broken air conditioner, damaged ceiling, torn and dirty curtains, worn out upholstery, and other disfigurements.

The unit deployed in Camarines Sur has already trained 3,250 students and 469 teachers. Lessons conducted included the introduction of the Internet, multimedia presentation, and procedures in operating an LCD projector.

Two refurbished units with plate numbers SFK 514 and SFK 534 are now awaiting deployment at the SEI grounds. However, in view of the problems encountered in the regional implementation of the project, SEI now required interested regions to submit the following for evaluation: resource generation scheme to cover implementation expenses, project management scheme, and the commitment of all possible project cooperators.

Cebu province has already initiated coordination for the deployment of one MITC unit for three years. The remaining unit will be transformed into a Science Explorer Bus equipped with built-in educational facilities like Kiddie Science and Mobile Laboratory for Science and Physics, to be managed and implemented by SEI.

Curriculum Development Programs

Developing a Model S&T Enhanced Curriculum for Pre-School

In developing a critical mass of S&T human resources, SEI provides support to the DOST vision of inculcating science

concepts to children as early as possible. Together with LABWORKS Educational Services, it seeks to come up with a model framework that will increase motivation and inclination to science, beginning with the DOST Day Care’s nursery and kindergarten levels.

The program aims to enhance analytical and problem solving skills and processes that are applicable in the children’s daily lives, complemented with basic technology education to help them keep up with our more technologically oriented society.

- The program emphasizes three major directions:
1. Less content should be covered. Students must be allowed to discover and learn in depth a few major concepts and principles.
  2. Science should be presented to students as interdisciplinary, connected to art, mathematics, language arts, social studies, music and physical education. All of these areas can be integrated rather than taught as isolated content areas.
  3. Students should explore interrelationships among science, technology and society.

The first half of the curriculum focused on instilling in children and teachers the scientific process of inquiry, critical thinking, making predictions and hypothesis, among others. Topics included The Human Body and Emotions, Health and Nutrition, Safety and The Family.

In the second half, which commenced in November 2008, emphasis was placed on the application of the scientific process in trying to understand science concepts, which included concepts on change, the weather, light, animals, environment, magnetism, and the use of a variety of tools.

After completing the school year 2008-2009, a two-week intensive summer camp was held in April 2009. The pilot project was afterwards extended from June to December 2009 for the continued training and mentorship of teachers. Selected students who graduated in kindergarten were also monitored and evaluated to determine the efficacy of the enhanced S&T curriculum.

The program will eventually be implemented in other preschools and elementary schools.

Scriptwriting lessons in English and Filipino with Mathematics and/or Science Content in Grades 1-4 for CAI Development

In collaboration with the Reading Association of the Philippines (RAP), SEI gave financial support to this project that aims to produce 40 modules in English and 40 modules in Filipino, both integrated with science and mathematics content. These modules are part of the development of Content Based Instruction (CBI), which is a significant approach in second language acquisition. CBI is encouraged even by the Revised Basic Education Curriculum because of its effectiveness in developing students’

ability to learn more than one skill in a single lesson or unit. In 2009, the scripts for the 40 modules each in English and Filipino were finalized and ready for digitization.

Having CBI modules infused with science and mathematics content will highly motivate students to learn these subjects and their concepts relevant in this highly interactive technology-driven world. Through the innovative application of tape, disk, and interactive computer programs, one can enhance experiential learning, imparting facts while simultaneously establishing a link between the classroom experimental activities with the world outside the classroom. With this combined teaching and learning mechanism, teachers can tailor their activities to the individual needs of their students, such as those for rapid learners and slow learners, and have more time for laboratory and problem-solving activities.

Interactive Science and Mathematics Courseware for Secondary Level Schools

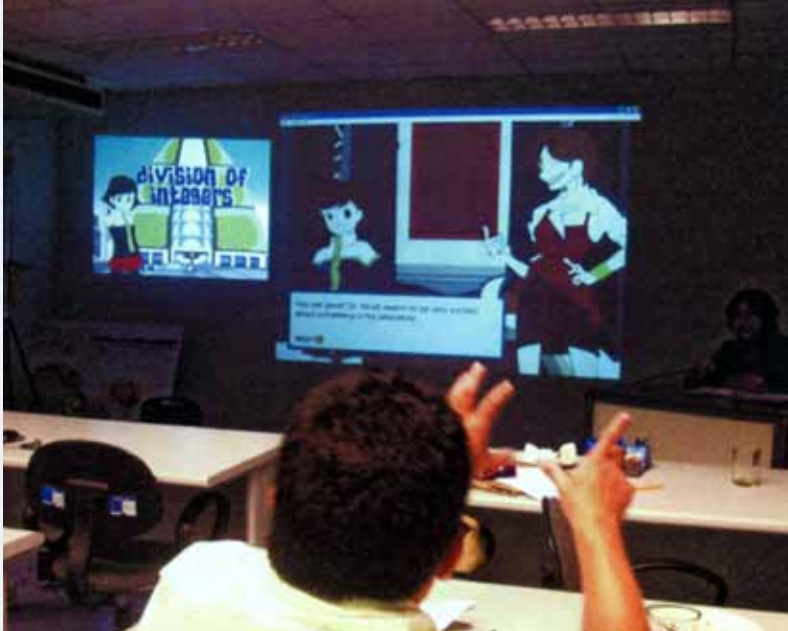
This project aims to produce interactive courseware for science and mathematics for secondary schools. It is divided into five phases. During phase I, the Courseware Website was launched, enhanced and maintained, the license agreement for the courseware modules was drafted, project staff members were recruited and hired, and technical equipment were procured.

During Phase II, which started in April 2009, 24 modules in both Mathematics and Science were developed, more project staff continued to be recruited, and software and equipment were readied for digitization. The target is to produce coursewares composed of 300 science lessons and 260 mathematics lessons selected from the topics of the Department of Education curriculum.

- The digitized materials have the following functionalities:
- Animated guided drill with audio and visual to give students the ability to visualize objects that are difficult or impossible to view;
  - Poses questions regarding the topic, returns feedback, and selects additional questions based on the students’ responses; and
  - Navigation buttons for going forward or back to the previous or next discussion.

Other Initiatives

**Workshop on Microscale Chemistry.** To contribute to the improvement and updating of chemistry education in the country, SEI also supported efforts to promote microscale chemistry, which makes teaching of chemistry laboratory courses accessible to many schools, colleges and universities. This method involves downscaling of experiments, using reduced quantities of chemical substances, and creating



Science and Mathematics Courseware Development staff in action.

improvised low-cost set ups. This approach greatly reduces the financial requirement of the courses and encourages schools, colleges and universities to offer more hands-on laboratory activities.

**Pinoy Science Storybook.** SEI’s support to the Philippine Association for the Advancement of Science Inc. (PhilAAS) extended also to the latter’s project, the Pinoy Science Storybook series. This aims to produce books on various science topics with eye-catching illustrations and interesting texts to entice the youth to take up science and contribute to the development of a scientific culture among Filipinos in general. In 2009, the concepts, topics and personages to be featured in the comic books were identified, and five science storybooks are currently being written.

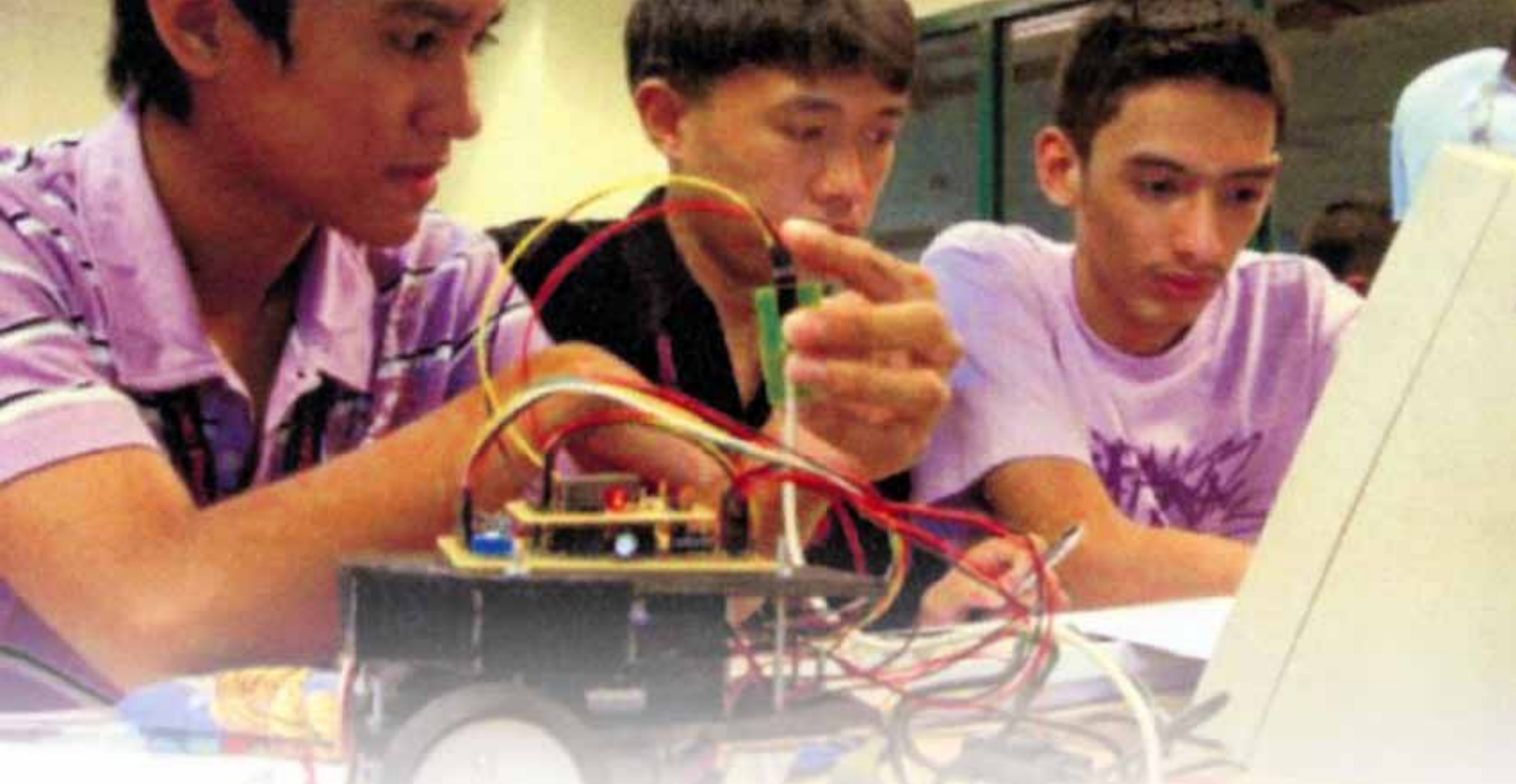


Pre-schoolers go through the Model S&T enhanced Curriculum.





# *Strengthening Capabilities in Science Education Research*



*Last year saw the introduction of various measures and other developments to improve our research and development (R&D) capabilities and the performance of R&D institutions. Strong business linkages towards this end were established – such as the Microsoft tech hub that opened in the University of the Philippines and the first Materials Library in Cebu City opened by European businessmen to boost local entrepreneurs’ R&D capabilities.*

Equally commendable were individual achievements that have long-lasting and far-reaching consequences. Dr. Christopher Bernido and Dr. Ma. Victoria Carpio-Bernido, both Physicists-researchers-educators, showed their commitment to national development by establishing the Central Visayan Institute Foundation in the remote seaside community of Jagna in Bohol to push for physics research and revolutionize high school education in the country.

In the area of legislation, the passing of House Bill 5208—the Technology Transfer Bill—is expected to create a strong Intellectual Property regime as it paves the way for improved access to technology, funding sources and clearly defined rules in terms of ownership of creations or innovations, encouraging Filipino creativity and invention.

While it may be true that our R&D culture is still sorely lagging behind our Asian counterparts, we are witnessing every year a growing awareness of the important link between research investment and our country’s strength and capability to progress in a knowledge-based economy.

## *Teaching-Learning Enhancement Programs*

### **TEDS-M Progress Report**

The Teacher Education and Development Study in Mathematics (TEDS-M), the 4-year international comparative study of primary and secondary mathematics teacher preparation, completed its second year with continued support from the Science Education Institute. Launched in 2007 in partnership with the Philippine Council of Mathematics Teacher Educators (MATHTED), it provides opportunities to its 17 participating countries to conduct research on their teacher education system and to learn from best approaches used in other countries. Its main goal is to show how much teacher preparation policies, programs, and practices across the world contribute to the capability to teach mathematics well in primary and lower secondary schools.

The project includes the following components:

- Studies of the country context, teacher policies, programs and practices on the national level



- Studies at the international level of curricula and practices of teacher preparation including standards and expectations for teacher learning
- Studies of the impact of teacher preparation on the knowledge, skills and dispositions acquired by future teachers

The entire study is being conducted under the auspices of the International Association for the Evaluation of Educational Achievement (IEA), a consortium of research institutions in 60 countries. In the Philippines, 52 teaching training institutions are participating in this significant international collaborative research project.

Following the Main Survey conducted in 2008, the National Research Center-Philippines (NRC) was able to submit the country data required by the International Study Center for inclusion in the cross-national analysis. In 2009, these activities were undertaken:

- Cleaning Up of Data on Mathematics Content Knowledge and Mathematics Pedagogical Content Knowledge
- Data Verification with IEA-Sampling Unit DPC
- Scanning and Mailing of Survey Materials to Survey System-Canada
- Curriculum and Syllabi Analysis-National Level
- Submission and Review of Curriculum and Syllabi Analysis Results to International Study Center
- Data Encoding for General Pedagogy
- Data Verification for General Pedagogy
- 5th NRC Meeting, Chicago, Illinois, March 9-13, 2009
- 6th NRC Meeting, Santiago, Chile, July 20-24, 2009
- Review and Feedback of Initial Send Out Documents from ISC and IEA-DPC; Sampling Frame Report and Adjudication, Grouping Program Types; National Sampling Design; Data Structure, etc.

Participants develop their capabilities during the Science Camp



## Project MOVE UPS

The Project Mindanao Opportunities for Vitalized Education and Upgrading of Science (MOVE UPS), the 3-year program that aims to strengthen the capabilities of the 60 identified Muslim-dominated feeder elementary schools of the Philippine Science High School-Central Mindanao Campus in Balo-i, Lanao del Norte, had a very productive year in 2009.

Its list of accomplishments includes:

**First Year Science Camp, April 14-18, 2009.** – This was participated in by 100% of its target participants – 121 science and mathematics teachers and 122 pupils. It aimed to improve the performance of the students in the feeder schools; develop their awareness, interest and motivation for S&T; involve them in real life situations involving science and mathematics; and develop their creativity, originality and artistic abilities. Another activity, the Division Supervisor's Training, was conducted for 14 Division Supervisors during the Science Camp to help them effectively oversee the feeder schools.

**Teachers' Training Program, May 16-31, 2009 and July 20-31, 2009** – To enhance the teaching capabilities of elementary science and mathematics teachers, this annual undertaking was implemented and attended by 360 teachers.

**Principals' Training/ Conference, October 14-15, 2009.** – In its second year of implementation, this program involved 57 principals to a conference aimed at inculcating the importance of good management practices in the 60 science-oriented feeder schools. It was held at the UPNISMED.

**Aptitude test for grade school pupils, August 5-19, 2009** – Pilot tested at MSU-IIT, Iligan City, this program was administered in selected schools within the Autonomous Region of Muslim Mindanao (ARMM). The resulting data, analyzed for future reference, were utilized in a paper by Dr. Dolores S. Pattuinan and presented to the APEC Forum held on November 9-10, 2009.

### Other activities:

- Development of project manual, principals' handbook and parents' handbook, 125 initial copies of which were all distributed to the intended recipients. The mentoring guidebook/ reviewer was also developed after a series of writeshops in August 2009 and was validated within September-October, 2009.
- Distribution of laboratory equipment and ICT support, including library references and other materials, to the 60 feeder schools. As of December 2009, 6,300 copies of books, purchased from UPNISMED, were delivered to the DOST Regional Office X and DOST ARMM. An additional 4,200 books purchased at Vibal Publishing

Principals of the science-oriented feeder schools undergo training



House, Inc., are to be delivered in the first quarter of 2010. In January, 2010, the SEI Inspection Committee has been tasked to inspect these materials.

SEI will continue to provide financial support to Project MOVE UPS with the aim of providing a favorable learning environment in Muslim dominated schools and improve the performance of their students in science and mathematics education.

## Developing Mathematical Pedagogical Knowledge

A training workshop was conducted as the initial step towards the implementation of the Framework for Mathematics Teacher Education. Held from May 11-15, 2009 at the UP-NISMED, this activity was meant to develop teachers' pedagogical knowledge in mathematics to enhance their teaching effectiveness, in light of several studies that pointed to their generally low competencies on Mathematical Pedagogical Knowledge (MPK) particularly among Filipino mathematics teachers. MPK is defined as the understanding and employment of teaching approaches, learning theories, assessment principles and modalities particular to mathematics due to its peculiar nature.

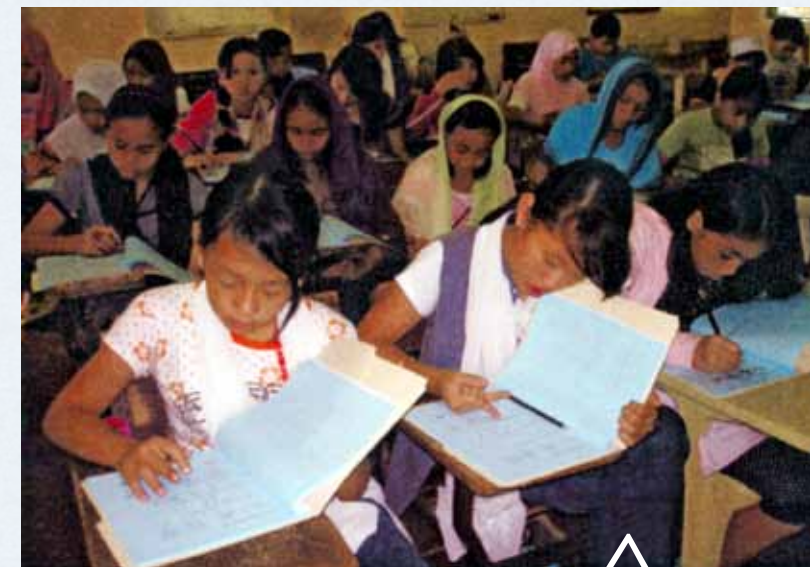
More specifically, the training workshop sought to develop class activities that demonstrated real understanding of MPK, particularly in the teaching of Pre-Algebra and Algebra and participants must be able to write these in the form of lesson plans. Lastly, the participants must be able to show their appreciation for and understanding of MPK by writing out a plan for an echo seminar in their respective schools.

Thirty-eight (38) participants attended the workshop, 14 of whom were from NCR, 10 from Region III, 11 from region IV-A, 1 from Region IV-B, one from Region VIII, and one from Region 1. Out of 20 slots available for Grade 5 and 6 teachers, only 13 were filled up.

SEI gave its support via financial assistance given for the staff, supplies and materials, and for other expenses.

## International Conference in Mathematics Education

The Philippine Council of Mathematics Teacher Educators



Grade School pupils participate in the pilot run of the Aptitude Test

(MATHTED) conducted an International Conference in Mathematics Education with the theme "Setting Goals, Directions and Standards in Mathematics Education." The event, held on October 23-24, 2009 at the Palawan State University, Puerto Princesa, Palawan, aims to update mathematics educators and specialists on the current trends and issues concerning mathematics education and research.

SEI gave financial support to this event for the printing and reproduction of 218 copies of conference proceedings.

## ASTHRDP – Lecture Series in Mathematics for MS and PhD program

To provide new learning techniques and capability for doing research studies in the teaching of science and mathematics, SEI sponsored and organized this lecture series for graduate scholars under the Accelerated S&T Human Resources Development Program (ASTHRDP).

Held from November 16-20, 2009 at the West Visayas State University, this event was attended by 14 M.S. and 20 Ph.D. Scholars under the Graduate Scholarships Program of the



Visayas-Mindanao Consortium.

Foreign visiting professor Dr. Sharon Senk from Michigan State University gave lectures on these topics:

- What is Mathematical Understanding?
- Assessment in Teacher Education for Science and Mathematics Education
- Assessing Knowledge for Teaching Mathematics in Primary School
- Pedagogical Content Knowledge for Teachers of Secondary Schools Mathematics

Mathematics Professor Dr. Roberto Corcino from Mindanao State University focused on specific mathematical contents such as:

- Fermat’s Little Theorem
- Congruence Relation of the Classical Stirling Numbers
- Euler’s Totient Function
- RSA Encryption System

The participants also tapped both experts as consultants on their research papers.

AP Conference on Chemistry Education and 24th Philippine Chemistry Congress

The Asia-Pacific Conference on Chemistry Education, held on April 14-16, 2009 at the Bohol Tropics Hotel, Tagbilaran City, gathered educators, researchers and students of chemistry from the region to discuss the challenges of bringing solutions to the needs of the public through technologies and advances in chemistry education.

Concurrently held was the 24th Philippine Chemistry Congress, the gathering of local counterparts in chemistry education with the purpose of sharing ideas on current trends in chemistry research, education and industries, and establishing network and pursuing continuing studies.

The event was organized by the Philippine Federation of Chemistry Societies, Inc. (PFCS) in cooperation with the Philippine Association of Chemistry Teachers, Inc. (PACT).

SEI supported the registration and accommodation of five foreign speakers who were invited to deliver talks on the current trends and issues involving chemistry education. The local and foreign delegates, on the other hand, participated in scientific paper and poster presentations.

Chem Camp 2009

SEI likewise gave financial assistance to half of the 80 students who participated in the annual Chem Camp, which was held from April 20 to May 8, 2009 at the Ateneo de Manila University. This summer enrichment program provides students a comprehensive view of the major fields of chemistry, which includes organic, inorganic, biochemistry, analytical and physical chemistry through various experiments and activities. Several activities included chemistry experiments that highlighted the principles behind ordinary things, making marketable designs for the products from their experiments, and other opportunities that developed their knowledge, creativity and resourcefulness.

SEI’s fund also covered the salaries of faculty and teaching assistants, the chemicals and materials purchased for the activities, and the printed laboratory manuals.

Capability Building on Nurturing and Assessing the Gifted in S&T

SEI provided financial assistance on a capacity building program implemented by the Philippine Science High School system among teachers of different PSHS campuses. The program was aimed at equipping school faculty with the knowledge and skills in assessing gifted students enrolled in their respective institutions and developing necessary knowledge and skills to deal effectively with such students.

Training sessions were conducted by cluster starting March to June 2009 with a total of 297 teacher-participants in attendance. The topic Handling and Assessing Gifted Students was tackled by way of lectures on its principles and theories, case studies, and hands-on exercises.

44th Annual BIOTA Convention and Scientific Sessions

With problems on climate change and depletion of resources as its backdrop, the 44th Annual National BIOTA Convention and Scientific Sessions was conducted with the theme “Biologists Exploration and Conservation.”

The convention was held on April 2-4, 2009 at the University of Makati, drawing 238 biology teachers and students. SEI provided financial assistance to 20 teachers who participated. The activities included plenary sessions, workshops and lectures by competent speakers who shared myriad views on the subjects.

Overall, the event emphasized the vital role of biologists in the exploration and conservation of our environment and natural resources via activities that focused on global issues concerning alternative energy sources, climate change, and bioresource conservation, among others. It also sought to identify effective ways by which contemporary teaching approaches and practical methods can be integrated into the Biology course at different levels of education.

Professional Development Program for Physical Science Teachers

To support the enhanced teaching capabilities of physical sciences teachers, specifically in Regional Science High Schools, SEI funded the 5-day Professional Development Program held on April 20-24, 2009. In attendance were 32 teachers found to have the aptitude, technology skills and youthful enthusiasm in using the backward design model being proposed for curriculum development.

The backward design model encourages teachers to develop individual lesson plans to teach physical science subjects, instead of training them on existing unit plans that they could eventually use in their classes. By adopting this capacity building approach to professional development, the physical sciences teachers learn to marry theoretical knowledge with practical skills.

In a collegial and interactive environment, the training was composed of plenary and workshop sessions that included designing and revising of unit plans done by teacher-participants in pairs. These plans were presented among their peers and before facilitators from UP-NISMED for feedback

and critiquing. Like in other trainings, evaluation was done with the use of 18-item Likert-type and a 2-item open-ended instrument.

Upon evaluation, the participants showed favorable reception to the professional development program, displayed enthusiasm to apply the model for teaching, and recognized the importance of employing the backward curriculum design in their role as educators. Several recommendations were made to further solidify the success of the training program. In addition to having additional days of training to improve their unit plans, the participants must consistently be exposed to and employ the backward design model, and undergo a sequel program to further build their confidence and competence. Department heads, principals and science supervisors must likewise undergo a similar professional development program.

S&T Human Resource Development Planning (STHRDP) Project

1. The Science and Technology Skills Migration Study published and disseminated last year the first part of its report to various government agencies and public and private universities. Published in 2008, it was entitled “Emigration of Science and Technology Educated Filipinos 1998-2006.”
2. The Philippines’ dismal performance in the 1999 and 2003 Trends in International Mathematics and Science Study (TIMSS) prompted SEI to implement in 2008 the project entitled “Financial Assistance for the Trends in International Mathematics and Science Study (TIMSS)-Related Studies: A Research program on Improving Science Education.”

The project is aimed at: 1) addressing the key issues identified as critical factors in improving the level of achievement in science and mathematics among Filipino students; 2) encouraging S&M teachers and educators to undertake research activities in aid of improving the curriculum, the delivery system, resources and other factors identified

as crucial to improving performance in S&M by Filipino students; 3) providing funding support to TIMSS-related research undertakings; and 4) identifying measures and solutions and documenting effective practices in S&M teaching and learning based on empirical and/or qualitative studies.

The following project proposals were funded and implemented in 2009:

- *Diagnosing Students’ Difficulties in Learning Mathematics: Basis for the Development of a Remediation Program*, Mrs. Marie Jean N. Mendezabal, University of Saint Louis, Tuguegarao City, Cagayan;
- *Mathematical Competencies of Secondary School Teachers of Region 2*, Dr. Pyrene T. Quilang, University of Saint Louis, Tuguegarao City, Cagayan; and
- *Exploring the Culture in a Grade 4 Science Classroom: Teaching and Learning Practices and Student Performance*, Dr. Ricardo T. Bagarinao, UP Open University, Los Baños, Laguna.

Dr. Sharon Senk from Michigan State University delivers her lecture





# Promoting Science and Technology Awareness and Consciousness



*Through all its years of promoting the importance of science and technology to the youth and the public, SEI is encouraged by the growing catalytic reactions happening around the country. Despite the lack of major long term interests on the country's scientific community, every year we continue to see students who haul in top medals from various competitions here and abroad. In 2009, the number of Filipino students who bagged international awards in these areas increased by almost 50 percent,*

with the majority coming from public elementary and high schools, as a result of the government's intensified efforts to improve science and mathematics education in the country.

Even if our research capabilities are sorely lacking, we take inspiration in continuing to recognize award-winning research initiatives from the youth. Our learning institutions continue to benefit from a stream of education funds and support strategies from private and public sources. And we continue to derive further inspiration from dedicated individuals like Efren Penaflorida, the CNN Hero of the Year, who literally push education for the youth through his "Kariton Klassrum."

Despite the challenges of our educational environment, combined with the catastrophes brought about by Ondoy and Pepeng, our young achievers lend their voices to other young people to look into science and engineering and be part of the country's development.

## *S&T Promotions Programs*

### **BPI-DOST Best Project of the Year Awards**

This annual project of the DOST and the BPI Foundation, Inc. continues to turn in a healthy number of research materials from the graduating students of 10 BPI-accredited universities. For the school year 2008-2009, 30 student-participants submitted research papers for preliminary screening, during which the evaluators/ judges selected the top 12 projects. The evaluators were composed of six DOST experts who evaluated the research papers focusing on the technical aspect, while the experts from BPI focused on the business aspect.

From among the six finalists chosen for oral presentation of their research materials on January 19, 2009, three (3) winners were chosen by the Board of Judges, namely:



Award Won/Amount	Name of Student/School	Project Title	Adviser
<b>Best Project of the Year</b> P50,000 from DOST-SEI plus trophy & certificate from BPI	<b>MIKHAIL P. SOLON</b> <i>UP-Diliman</i>	Analysis of Selected Non-linear and Non-Local Systems	Dr. Jose Perico H. Esguerra
<b>1st Runner-up</b> P30,000 from DOST-SEI plus trophy & Certificate from BPI	<b>STEPHEN MICHAEL H. CO</b> <i>Ateneo De Manila University</i>	Design & Construction of a Synthetic Coconut Cadang-Cadang Viroic cDNA	Dr. Merab A. Chan Mr. Neil H. Tan Gana
<b>2nd Runner-up</b> P10,000 from DOST-SEI plus trophy & Certificate from BPI	<b>MARVIN C. MASALUNGA</b> <i>UP-Diliman</i>	Genetic Diversity of Philippines Trichomonas vaginalis ISOLATES using the 5.8s RIBOSOMAL RNA GENE	Dr. Windell L. Rivera



Participants of the Phil. Robotics Olympiad (PRO) during the final judging at SM North Edsa, Quezon City.

### Philippine Robotics Olympiad

On its 8th year of providing a venue for selecting the teams that will represent the country in the World Robotics Olympiad (WRO), the Philippine Robotics Olympiad (PRO) continues to entice a growing number of elementary and high schools teams to participate and hone their critical and intellectual thinking skills via creative, hands-on robotics design and programming.

The competition is open to elementary students aged 10-12 years old and high school students aged 13-15 years old, from both public and private schools. As in the previous years, there were two categories in 2009 – Regular and Open, which had the theme “Artists Robots.”

The PRO experienced a 31% increase in the total number of participants, from 40 high school and 25 elementary teams in 2008 to 58 high school teams and 27 elementary teams in 2009. This proves that robotics is an excellent way of promoting science and technology among the youth. The Board of Judges selected 29 teams from the HS level and nine teams from the elementary level to compete in the final judging. In the Open Category, there were 14 teams in the HS level and three in the elementary level.

In the final judging held on September 25, 2009, the Philippine Science HS-Bicol Region Campus and the Science & Technology Education Center-Cebu City won first and second places, respectively, in the Secondary-Regular category. For the elementary level, Claret School of Quezon City and Grace Chrisian College won first and second places, respectively. The judging was held at the SM North Annex Bldg., Quezon City.

For the Open category, Dr. Yanga’s College-Bulacan and the Makati

Science High School took first and second places, respectively. First Asia Institute of Technology & Humanities (FAITH) and Grace Christian College garnered the first and second places in the elementary level.

Eventually, eight teams, two elementary and two HS teams each for the Regular and Open categories, were sent to Pohang, Korea on November 6-8, 2009 to participate in the 2009 World Robotics Olympiad. SEI, together with long time private partner Felta Multi-Media Inc., worked together to ensure their participation to this event.

### 2009 World Robotics Olympiad

The World Robotics Olympiad (WRO), considered the pinnacle of excellence and achievement in robotics for elementary and secondary students, is an annual event that brings together young robotics scientists from all over the world to develop their creativity and problem-solving skills through computer technology, basic engineering, mechatronics, and communications. SEI has been providing technical support since 2006 in planning and implementing this project, while Felta Multi-Media Inc., provides the airfare, hotel accommodation and other expenses of the Philippine delegation.

The Philippine delegation included students from the following schools:

- Elementary Level-Regular Category:
  1. Claret School, Quezon City
  2. Grace Christian College, Quezon City
- Elementary Level – Open Category:
  1. First Asia Institute of Technology & Humanities (FAITH), Batangas City
  2. Grace Christian College, Quezon City
- High School Level – Regular Category:
  1. Philippine Science HS-Bicol Campus
  2. Science & Technology Education Center, Cebu City
- High School Level – Open Category:
  1. Dr. Yanga’s College, Bulacan
  2. Makati Science High School

The two elementary teams namely Claret School in Regular category and Grace Christian College in the Open category both received the Judges’ Choice Award.

### Philippine Mathematical Olympiad (PMO)

SEI continued its sponsorship of the Philippine Mathematical Olympiad (PMO) in 2009. On its 11th year of being the oldest and most prestigious national mathematics competition among high school students around the country, the PMO selects the best in mathematical problem-solving skills among secondary students nationwide with the aim of selecting the participants to the International Mathematical Olympiad (IMO). The national competition is implemented by the Mathematical Society of the Philippines (MSP) in cooperation with SEI.



Carlo Francisco Adajar of Paref Southridge School, first place winner of the 11th PMO, with Dr. Fidel Nemenzo, President (MSP), Dr. Fe Hidalgo, DepEd Undersecretary; DOST Usec. Fortunato T. Dela Peña; and Mr. Ariel Marcera, coach.

In the Qualifying Stage, 2,896 high school students (719 from Mindanao, 570 from Visayas, 1,290 from Luzon and 317 from NCR) took the written competition. Eventually, 219 students made it to the Area Stage competition (52 from Mindanao, 56 from Visayas, 57 from Luzon, and 54 in NCR).

In the National Stage competition, Carlo Francisco Adajar of Paref Southridge School bested 20 other qualifying students, receiving P15,000 cash prize. In second place was Carmela Antoinette Lao of St. Jude Catholic School, winning P10,000, and third place went to Aldric Cristoval Reyes of Chang Kai Shek College, who received P5,000.

### International Mathematical Olympiad (IMO)

The International Mathematical Olympiad (IMO) is the largest, most prestigious and most difficult mathematics competition among the best secondary students around the world. In 2009, the IMO marked its 50th year with the participation of 565 student-contestants from 104 countries and territories. It was held in Bremen, Germany on July 10-22, 2009.

SEI tapped the expertise of the Mathematical Society of the Philippines (MSP) to take charge of the selection of participants to the competition. Likewise, through SEI funding, the MSP implemented an intensive series of trainings for the potential local IMO delegates to ensure they gain the necessary problem-solving skills that come up to the IMO standards. This is extremely necessary since the level of problems given in the Philippine classrooms are way below the level of problems given in the IMO in terms of depth and difficulty, even including topics that are missing in the local high school curriculum.



The 2009 Philippine team was composed of four students, namely: Carlo Francisco E. Adajar, Jonathan S. Wong, Earl John R. Chua of Ateneo de Manila University, and Carmela Antoinette Lao. They were headed by Team Leader Dr. Ian June L. Garces of Ateneo de Manila University and Deputy Team Leader Dr. Julius M. Basilla of UP-Diliman.

Carmela Antoinette Lao won a bronze medal in the competition.



Carmela Antoinette Lao shows off the bronze medal she won at the 50th International Mathematics Olympiad (IMO) with Dr. Ester B. Ogena, Sec. Estrella F. Alabastro, Dr. Fidel Nemenzo, and Dr. Alfred Lao during the courtesy call to the DOST Secretary.

Philippine International Mathematics Competition (PIMC)

The biggest cause for celebration occurred during the Philippine International Mathematics Competition (PIMC), which was held on November 28 to December 2, 2009 in Iloilo City. The Filipino students who participated in this event exceeded all expectations by emerging as the champions in the individual and team contests, garnering 24 gold, 32 silver and 44 bronze medals.

The PIMC consisted of two competitions, the 2009 Asia Inter-Cities Teenagers Mathematics Olympiad (AITMO) and the 2009 Philippine Elementary Mathematics International Contest (PEMIC). These were organized by the Mathematics Trainers' Guild (MTG), a non-stock, non-profit organization

that aims to promote excellence in math education and training, in partnership with SEI.

Over 400 students joined the prestigious competition grouped into 96 teams from 21 countries, namely: Bulgaria, Brunei, China, Cyprus, Hong Kong, India, Indonesia, Iran, Kazakhstan, Korea, Macau, Malaysia, Mongolia, Nepal, Nigeria, Philippines, Romania, Singapore, South Korea, Taiwan and Thailand.

2009 Australian Mathematics Competition

Even before the PIMC took place, Filipino math wizards made a big impact during the Australian Mathematics Competition (AMC), the annual international correspondence mathematics competition organized by the non-profit Australian Mathematics Trust in cooperation with the Mathematics Trainers' Guild (MTG) of the Philippines and DOST Regional Offices.

Besides the Philippines, other participating countries in the AMC are Australia, South Korea, Hong Kong, China, Taiwan, Malaysia, Bulgaria, Singapore, New Zealand, and Thailand.

Fourteen (14) students from 10 high schools nationwide bagged topped awards, including four students who received the most coveted AMC Westpac medals for outstanding performance. These were:

1. Seanne Ng of Saint Jude Catholic School
  2. Justin Edric Yturzaeta of Jubilee Christian Academy
  3. Julius Vincent Sy of St. Stephen's High School
  4. Amiel Sy of Philippine Science HS-Main Campus
- Meanwhile, the 10 other top awardees received the AMC Prize Award, the highest award given to those who made it to the top one percent of contestants. These are:
1. Audrey Celine Lao – Saint Jude Catholic School
  2. Czarina Lao – Saint Jude Catholic School
  3. Lormes Pedeglorio – Butuan City Special Education Center
  4. Miguel Lorenzo Ildesa – Parents for Education (PAREF)- Westbridge School
  5. Adrian Sy – Saint Jude Catholic School
  6. Aldric Cristoval Reyes – Chiang Kai Shek College
  7. John Russel Virata – Gideon Academy
  8. Alvin Uy Lim – Quezon City Science High School
  9. Emiliano Tan – Philippine Science HS – Main Campus
  10. Jake Gacuan – University of the Philippines

In addition, 43 other students garnered High Distinction certificates for being in the top two percent of examinees in their year level, while 11 students were given the Prudence Award for garnering the most number of correct answers from Question No. 1 of the contest.

The awardees were honored in the AMC-Philippine Awarding Ceremonies held at the Sofitel Hotel, Pasay City on October 19, 2009. Senator Alan Peter Cayetano and Dr. Peter

The four AMC medalists with (from left) Dr. Simon Chua, Ms. Juemain Diaz de Rivera, Dr. Leticia Catris, Sen. Allan Cayetano and Prof. Peter Taylor.

Taylor, Executive Director of the Australian Mathematics Trust (AMT), led in awarding the medals to the winners. Also present were Dr. Simon Chua, President of the Mathematics Trainers Guild-Philippines (MTG); Ms. Juemain Diaz de Rivera, Public Affairs Manager of the Australian Embassy; and Dr. Leticia V. Catris, SEI deputy director and officer-in-charge.

Youth Excellence in Science (YES) Awards 2009

Given the rich harvest of medals and citations that Filipino students reaped in international awards in 2009, the number of Youth Excellence in Science awardees increased by 36% from 2008. There were 297 winners in various international competitions – 191 from NCR and 107 from the regions.

The YES Medal, which is conferred to Filipino students who were able to win gold, silver, and bronze medals in international science and mathematics competitions, is a DOST institutional award for exemplary achievement of the youth in these fields. The ceremony was held on December 9, 2009 at the PHIVOLCS Auditorium, Quezon City and led by DOST Secretary Dr. Estrella Alabastro. In attendance were DOST Undersecretary Prof. Fortunato de la Peña, SEI Director Dr. Ester Ogena, SEI Deputy Director Dr. Leticia Catris, Phil. Science HS System Executive Director Dr. Filma Brawner, Mathematics Trainers Guild (MTG) President Dr. Simon Chua, and Mathematical Society of the Philippines (MSP) President Dr. Fidel Nemenzo.

Philippine Space Education Program

SEI's designation as the Secretariat and National Coordinator of the Philippine Space Education Program by the National Advisory Committee continued for the year in review, during which the agency conducted the following major activities:

International Year of Astronomy

2009 was designated as the International Year of Astronomy (IYA) by the International Astronomical Union (IAU) and UNESCO to help the citizens of the world rediscover their place in the Universe through the day- and night-time sky, and thereby engage a personal sense of wonder and discovery. This huge global program encouraged each country to run activities throughout the year with the aim of establishing collaborations between professional and amateur astronomers, science centers and science communicators.

SEI organized activities in Metro Manila in collaboration with two

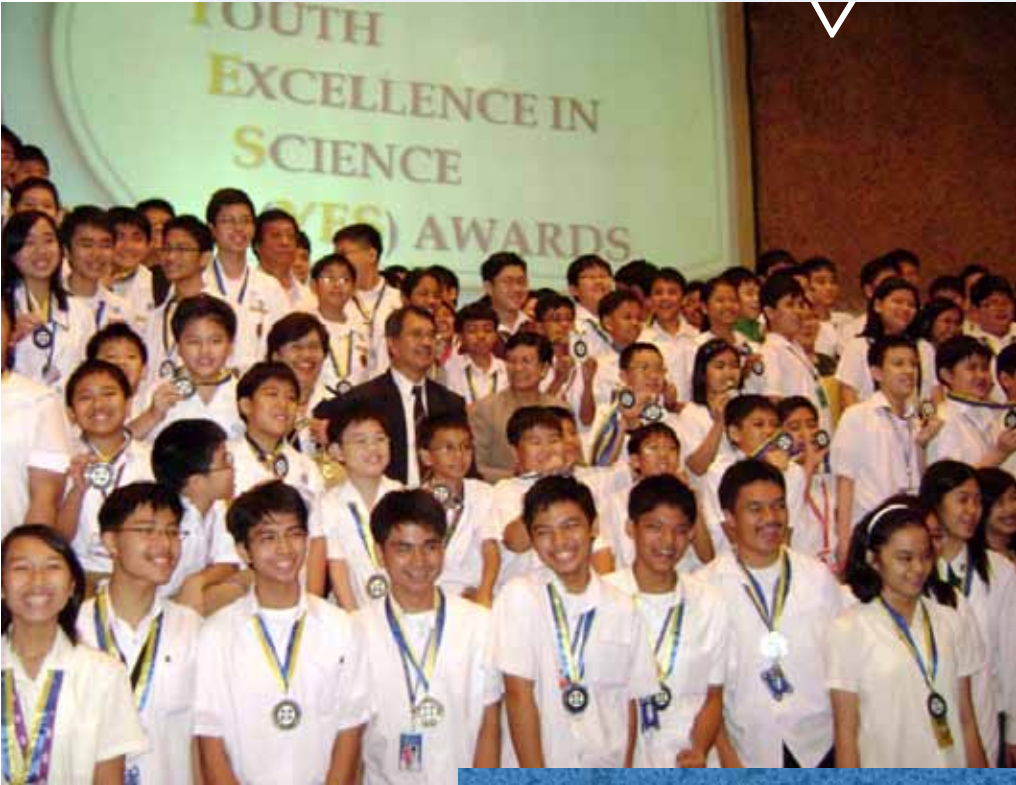


institutions: 1) the Philippine Foundation for Science & Technology (PFST); and 2) UP National Institute for Science & Mathematics Education Development (UPNISMED).

On March 2-7, 2009, the PFST held the following activities at the Philippine Science Centrum: 1) IYA information drive via leafleting; 2) Astro Activity on How to Make a Simple Telescope; 3) Film Showing at the Space Mini-Theater; 4) Launching of the Phases of the Moon exhibit.

SEI granted PFST financial assistance to create the Phases of the Moon exhibit, an additional interactive exhibit to its Space Gallery. A hundred grade school students from St. Martin de Porres attended the exhibit. Meanwhile, 40 college students from the UP-College of Education attended the Astro Activity and 100 elementary and high school students and teachers

The YES Awardees with DOST Sec. Estrella F. Alabastro, Usec. Fortunato de la Peña and SEI Director Ester B. Ogena.







◀ A student enjoys gazing through her self-made telescope.

took part in the other activities as part of their schools' educational trips.

On March 27-29, 2009, the UPNISMED conducted a Seminar Workshop on Astronomy for Science Teachers. In addition to helping teachers understand basic astronomy topics, it aimed to enhance their higher order thinking and manipulative skills in using astronomy-related software and equipment, and to help them determine and construct the best design for an improvised astronomy-related device.

The seminar included lectures, slide presentations, demonstrations, and hands-on activities such as water rocket launching, and skywatching. Twenty-six (26) elementary and high school teachers from Metro Manila, Cavite and Nueva Ecija, together with 10 science and mathematics specialists from UPNISMED, participated in this event.

#### *Regional/ National Water Rocket Launching Competition*

Creating water rockets shows how fun and challenging it is to use science and mathematics concepts, such as laws of motion, fluid dynamics, angle and height calculations, and the like. It is also an effective means of inculcating space education among students, teachers and the public. This is the reason why the Water Rocket Launching Competition is a staple activity in the Philippine Space Education Program.

In 2009, the water rocket activities were held in Regions 6, 8, 9 and 11, organized by the DOST Regional Offices. A



◀ A Seminar Workshop on Astronomy for Science Teachers held last March 27-29, 2009 conducted by the UPNISMED.

(Lower left): Regional Water Rocket Launching Competition held at the Leyte Provincial Sports Complex, Tacloban City, Leyte.

The 1st place winner, ADFC Team with DOST Regional 8 staff, ADFC school officials, SEI staff and DepED Region 8 official.



lecture-demonstration on water rocket making was conducted prior to the launch of the competition proper.

The team from Asia Development Foundation College (ADFC) of Tacloban City (Region 8) was selected to represent the country in the Asia Pacific Regional Space Agency Forum-16 (APRSAF) International Water Rocket Event held at the National Science Museum, Pathumthani, Thailand on January 23-24, 2010.

#### *Regional/National Poster Making Contest*

SEI cooperated with the Philippine Society of Youth Science Clubs (PSYSC) to conduct an on-the-spot Poster Making Contest during the Regional Level of the PSYSC's Science Olympiad (PSO), which was part of the celebration of the National Science Club Month.

With the theme "Our Universe-Great Discoveries," this activity encouraged children to expand their imaginations and express what they may find in the universe. Elementary students from 7 regions (Regions 1,3, 4A, 10, 11, CARAGA, and NCR) participated in the regional contest. The three best posters in each region competed in the National leg of the contest.

The overall winners were: 1st place – Jamia Mei Tolentino of St. Stephen's High School, Manila; 2nd place – Caisa Subia of San Beda College-Alabang; and 3rd place – Eunice Angel Cruz of Kalalake Elementary School, Olongapo. They received P5,000, P3,000 and P2,000, respectively. The best poster became the official Philippine entry to the APRSAF-16 Poster Contest to be judged in Bangkok, Thailand.

#### **Gawad LIDER**

In 2009, the second Gawad LIDER, which stands for Leadership Innovations for Development Relevant to Science Education, organized the National Steering Committee composed of individuals from academic institutions and professional/private organizations recognized in the field of science and technology. Gawad LIDER gives recognition and incentives to individuals and/or institutions that made exemplary contributions to the development of science education, or through the development of science and technology-based innovations or inventions that improved education.

The committee is tasked to provide directions in the formulation of policy guidelines for the proper implementation of the project and for the selection of members of the Board of Judges. During its series of meetings in the year in review, the committee reformulated the guidelines and criteria for the selection of winners, and designated the Board of Judges for the preliminary and final stages. The Board of Judges for the Preliminary Stage held its initial meeting in December 2009 to finalize strategies in the evaluation of the nominees.

The Gawad LIDER awardees will be recognized during the celebration of the National Science and Technology Week in July 2010.

#### **FIRST Robotics Competition (FRC)**

The Philippine Team participated in the FIRST Robotics Competition (FRC) both at the regional event and the final championship. It aims to allow students to learn from play

with the "pros" of the science and engineering world; apply math and science concepts to design, build, test and compete with robots; gain hands-on experience in solving real-world problems; and discover the excitement and rewards of science and technology careers.

The student delegates comprised 20 Philippine Science High School-Main Campus students, six mentors (four from De La Salle University and two from the University of the Philippines-Diliman), two coaches from PSHS, two officials from DOST and a project Staff.

The Regional competition held in March 2009 at the University of Hawaii was a success as the Philippines won two major awards for rookies, the Highest Rookie Seed Award for having attained the highest rank among all rookies, and the Rookie All Star Award for showing a young but strong partnership effort and implementing the mission of FIRST to inspire students to learn more about science and technology.

During the finals held in Atlanta, Georgia, the Philippines ranked 66th in its division.

Overall, FRC experience brought to the fore the need to intensify the introduction of robotics in high school, and inspired the students to take up courses in science and engineering in college.

Board of Judges and National Steering Committee members' meeting at Astoria Plaza.





Tagisang Robotics

With the aim of raising the interest of students in the fields of science and technology through robotics, SEI organized and launched a new initiative dubbed **Tagisang Robotics: Design, Build and Play Competition**. Specifically, this program hopes to help high school students discover how interesting and rewarding it can be to be engineers and researchers. It also helps them acquire and hone their skills in critical and creative thinking, teamwork, interpersonal communication and problem solving.

The program came about when Filipino students who participated in the FIRST Robotics Competition (FRC) Hawaii Regional in March 2009 revealed their great potential in the field of robotics. The Philippine team garnered the Rookie All-Star and Highest Rookie Seed Award, qualifying its members to the FRC Championship in Atlanta, Georgia. Although they received no award in the championship, the experience enhanced the relevance of Robotics as a scientific field that should be included and emphasized in the Philippine curriculum.

SEI created the National Organizing Committee through the DOST Special Order no. 400 dated July 23, 2009. It also conducted a “Workshop on the Game Design and Development for the Tagisang Robotics” to develop the game, rules, and kit-of-parts specification. The project was launched on July 20, 2009 at SM City Bicutan during the National Science & Technology Week celebration.

The committee, chaired by SEI Director Dr. Ester B. Ogena, was formed to help establish policy guidelines for the preparation and conduct of Tagisang Robotics. Its other members include electronics and mechanical engineering experts from the De La Salle University and UP-Diliman.

A “Workshop on the Development of Manual for the Tagisang Robotics” was conducted on November 13, 2009 at the Astoria Plaza, Ortigas Center, Pasig City to help explain the mechanics of the competition to students and teachers when building teams. The manual will be distributed to the participating schools to enable them to organize their teams, source out funding and sponsorships, build their robots, and play the game properly.

The Philippine Team to the FIRST Robotics Competition rejoices after it won the Rookie All Star and Highest Seed Award in the FRC Hawaii Regional.



2009 Science and Mathematics and Engineering Camp (SME)

Third year students were invited to the 2009 Science and Mathematics and Engineering Camp (SME) with the aim of encouraging them to study and explore these fields, pursue advanced scientific/technical degrees and career, and create pre-college research opportunities that can be published in science journals.

The SME Camp was held on May 4-12, 2009 with several lectures and laboratory activities conducted at these participating institutions: UP Diliman, UP Los Baños, Ateneo de Manila University, De La Salle University, University of Sto. Tomas, and Metro Subic Highlands in Morong, Bataan. The 268 participants were housed at the University Hotel, UP Alumni Center, and UPNISMED Hostel.

The rotation of the students in the different universities gave them valuable exposure to the institutions they would choose for their college education. Evaluation results revealed

The Science and Mathematics and Engineering (SME) Camp participants hone their knowledge. (bottom right): Ms. Philippines-Fire Patricia Marie Tumalak shares a story to the students during the Biotech for Kids Activity.



that the lecturers and facilitators were able to deliver the topics effectively and relevantly responded to the queries of the students. The laboratories were deemed well equipped and the topics presented were considered essential to their learning.

A proposal has been raised to implement the project in Cebu and Iloilo to benefit the students in Visayas and Mindanao.

Biotech for Kids

Seventy-nine (79) Grade 4 students and teachers participated in the SEI-sponsored 2009 National Biotechnology Week activity dubbed “Biotech for Kids” held on November 25, 2009 at the Nido Fortified Science Discovery Center, SM Mall of Asia.

The participating schools were: Upper Bicutan Elementary School; A. Bonifacio Elementary School; EM’s Signal Village Elementary School; Doña Pilar C. Gonzaga Elementary School; The Learning Tree Child Growth Center; Juan Sumulong Elementary School; Tibagan Elementary School; Francisco Balagtas Elementary School; Bagong Tanyag Elementary School Annex –A; UP Integrated School; Bagong Tanyag Elementary School Main; Bagong Tanyag Elementary School Annex B; Andres Bonifacio Elementary School.

Facilitated by Teacher Ryan Noleal of The Learning Tree Child Growth Center, the activities consisted of lessons in the subjects of heredity and of bioluminescence, a field of research in the biotechnology world, as well as story-telling sessions by Alitaptap Storyteller Percy Gapas and Ms. Philippines-Fire Patricia Tumalak.

2009 NSTW and Regional S&T Fairs

During the National Science and Technology Week, SEI showcased the country’s entry into the 2009 FIRST Robotics Competition held in Hawaii and Atlanda in an exhibit entitled “In Focus: 2009 FRC Team 3105 (The Filipino Youth and Robotics)”.

The SEI exhibits were displayed in the eight Regional S&T cluster fairs conducted at People’s Center, Tacloban, Leyte; SM Bacolod, Bacolod City; Dotie’s Hotel, Butuan City; SM Davao, Davao City; SM Sta. Rosa, Laguna; SM Naga City; and SM Rosales, Pangasinan. The scheduled exhibition at the Benguet State University in La Trinidad, Benguet was moved due to the onslaught of typhoons Ramil and Pepeng.

Other activities sponsored by the Institute

First Philippine Youth Science Congress

SEI provided financial assistance to the 2009 Philippine Youth Science Congress, a one-day event organized by the Philippine Society of Youth Science Clubs, Inc. (PSYSC) on March 7, 2009 at the Marikina Hotel, Marikina City. Elementary and high schools students and teachers numbering about 1,200 attended the series of lectures given by scientists and other experts focusing on the various sciences and their applications in our daily lives.

National Science Club Month

Likewise, SEI gave its support to the PSYSC’s commemoration of the 2009 National Science Club Month, which is celebrated every September. With the theme “Science Clubbers: The Catalyst for Global Change,” the project had



Students take a look at the SEI exhibit in SM Bacolod during one of the Regional S&T fairs.

(Topmost): The SEI Exhibit at SM Bicutan at the start of the 2009 National Science and Technology Week Celebration

many activities that were well participated in by all affiliates of the PSYSC:

- The National Science Clubs Summit, September 5-6, 2009, was conducted in Regions 6, 9, 11 and CARAGA and drew 4,000 participants.
- 6th PSYSC Science Olympiad (PSO), September 19, 2009 at the Nido Fortidied Science Discovery Center, SM Mall of Asia
- MATH-SCI-A-KA, September 26, 2009, was held at the same venue.

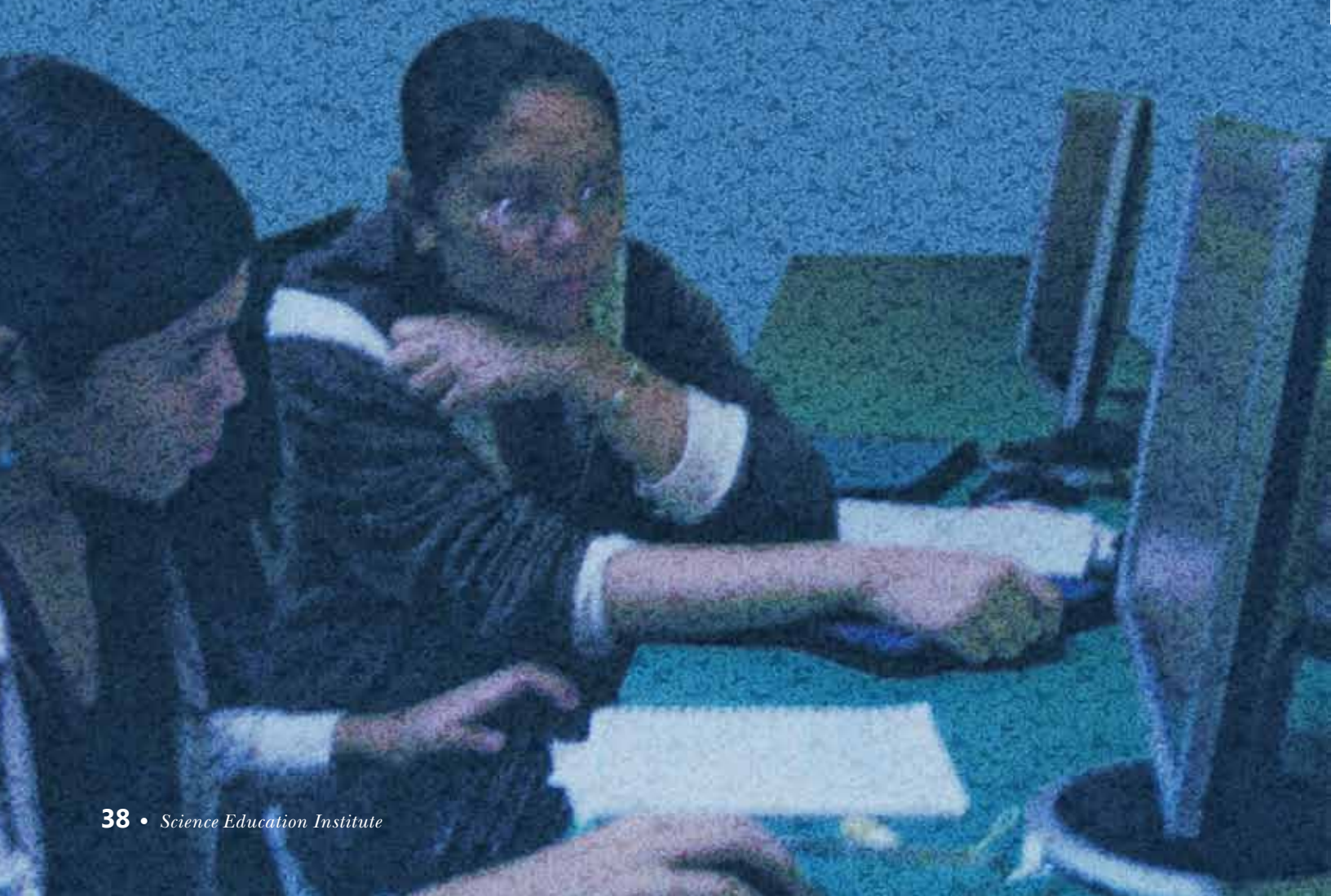
Search for Exhibits from the Youth Contest

The Philippine Foundation for Science and Technology (PFST) organized an interactive exhibit design competition called the Search for Exhibits from the Youth (SEXY), aiming to tap creative and brilliant ideas from 3rd and 4th year high school students for developing, designing and prototyping an interactive exhibit on topics on earth science, environment and natural phenomena. The finale of the contest, held on February 12, 2009 at the PSC Activity Area, produced the following winners:

- 1st place winner – Water Pressure and Gravity, UP Integrated School
  - 2nd place winner– Twirling Disaster, Grace Christian College
  - 3rd place winner– The Lunar Clock, Grace Christian College
- SEI sponsored the cash prizes awarded to the winners.



# Creating Communication and Information Links



Home » About SEI

*The most advanced countries and rapidly developing economies around the world acknowledge that technological readiness and innovation, coupled with good education fundamentals, are of critical importance to growth and development. Even in the midst of the crisis that swept across the world in 2008-2009, they maintained the importance of being highly networked within a solid ICT*

infrastructure, and their continued development owes much to a consistent focus in their national agenda on education excellence, innovation and extensive ICT access.

The Philippines has a long way to go in achieving this level of technological sophistication, as it has fallen from its 81st place in 2008 to 85th in 2009 in the Network Readiness Index contained in the Global Information and Technology Report 2008-2009. We even continue to lag behind our Asian neighbors like Vietnam and Thailand.

Even as our educators and policymakers invest resources into preparing students for a globalizing and technology-savvy world, we at the Science Education Institute focus on understanding the characteristics and impact of ICTs in education so we can

adequately plan, measure and ultimately implement and adopt a techno-centric approach to integrating ICT in learning.

## PHILSTEDDB Project

After a decade of maintaining a static website, the STedNet portal and other local-based SEI servers started their migration into a more stable and web 2.0-ready platform. The migration of existing databases and websites into their more dynamic and structured system took place in 2009.

While still in this phase, a secondary website at stednet.edublogs.org was created to ensure the continued presence of STedNet site content. Forty (40) new e-group members were added using the yahoo groups email collaboration, while the StedNet e-group system handled the distribution of 31 science education news articles and other announcements regarding the project. These activities were handled using open-source software like Joomla Content Management System.

The new database was installed on the secondary site while basic information was duplicated for the users. Frequently visited are the following: Thesis, Dissertations, Action Researches, Investigative Projects, and Science Centurms in the Philippines.

SEI also developed a new database and intra-blog site to host and manage the other databases of this division during the migration. Two (2) new databases, SEI Articles and Media Advisories, were created on top of the existing 14 databases being maintained. On the database for YES awardees, the names of 297 new awardees were added in 2009. The new site also enabled employees to easily communicate and have access to the frequently-used files or documents in the workplace like memos, events and meetings, project status, and software tools needed for networking like antivirus patches and other security updates.

A wireless repeater unit/hub and a net book unit were also acquired, and during the promotion of the new websites, promotional items were distributed in the six (6) regional S&T Tech Fairs in the country.



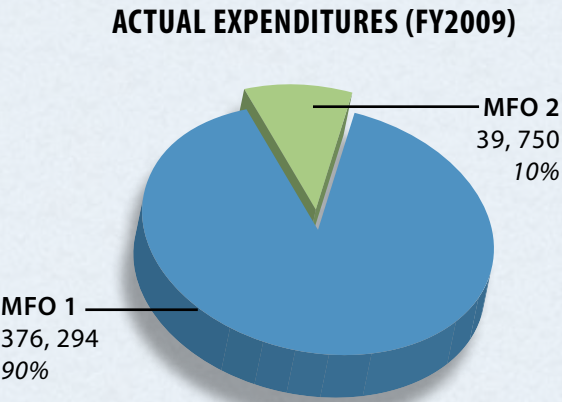


# Financial Report

## Statement of Allotment and Obligations (FY 2009)

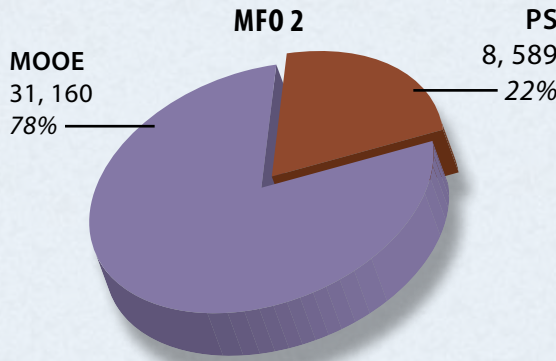
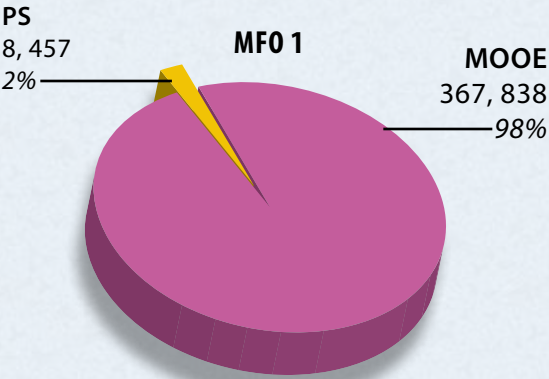
PAPs	PS		MOOE		TOTAL	
	Allotment	Obligations	Allotment	Obligations	Allotment	Obligations
1) General Administration and Support Services	10,281,945	10,280,404	6,274,000	5,814,742	16,555,945	16,095,146
2) Operations						
• Development, Utilization and Implementation of Science and Technology Scholarships	2,289,467	2,288,667	365,279,000	364,348,556	367,568,467	366,637,223
• Science Culture Development Promotion	2,805,060	2,794,705	3,269,000	2,982,547	6,074,060	5,777,252
• Research, Innovations and Training of Science Education	1,882,473	1,682,055	26,444,000	25,852,141	28,326,473	27,534,196
<b>TOTAL</b>	<b>17,258,945</b>	<b>17,045,831</b>	<b>401,266,000</b>	<b>398,997,986</b>	<b>418,524,945</b>	<b>416,043,817</b>

### Budget Distribution Per MFO (Amount in Thousand Pesos)

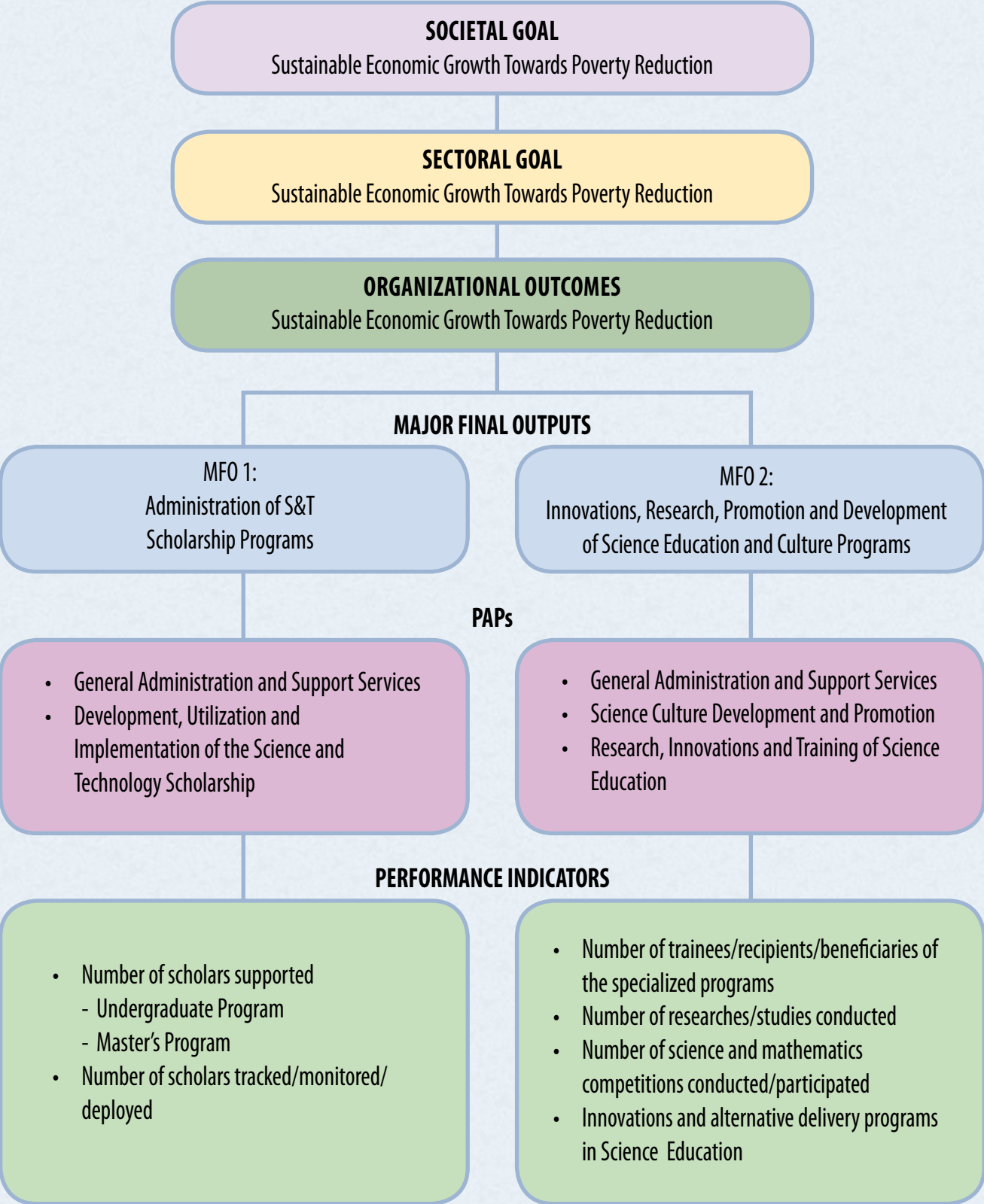


**MFO 1:** Administration of S&T Scholarship Program  
**MFO 2:** Innovations, Research, Promotion and Development of Science Education and Culture Promotion Programs

### FY 2009 Expenditures Per Major Expense Class and Major Final Outputs (Amount in Thousand Pesos)

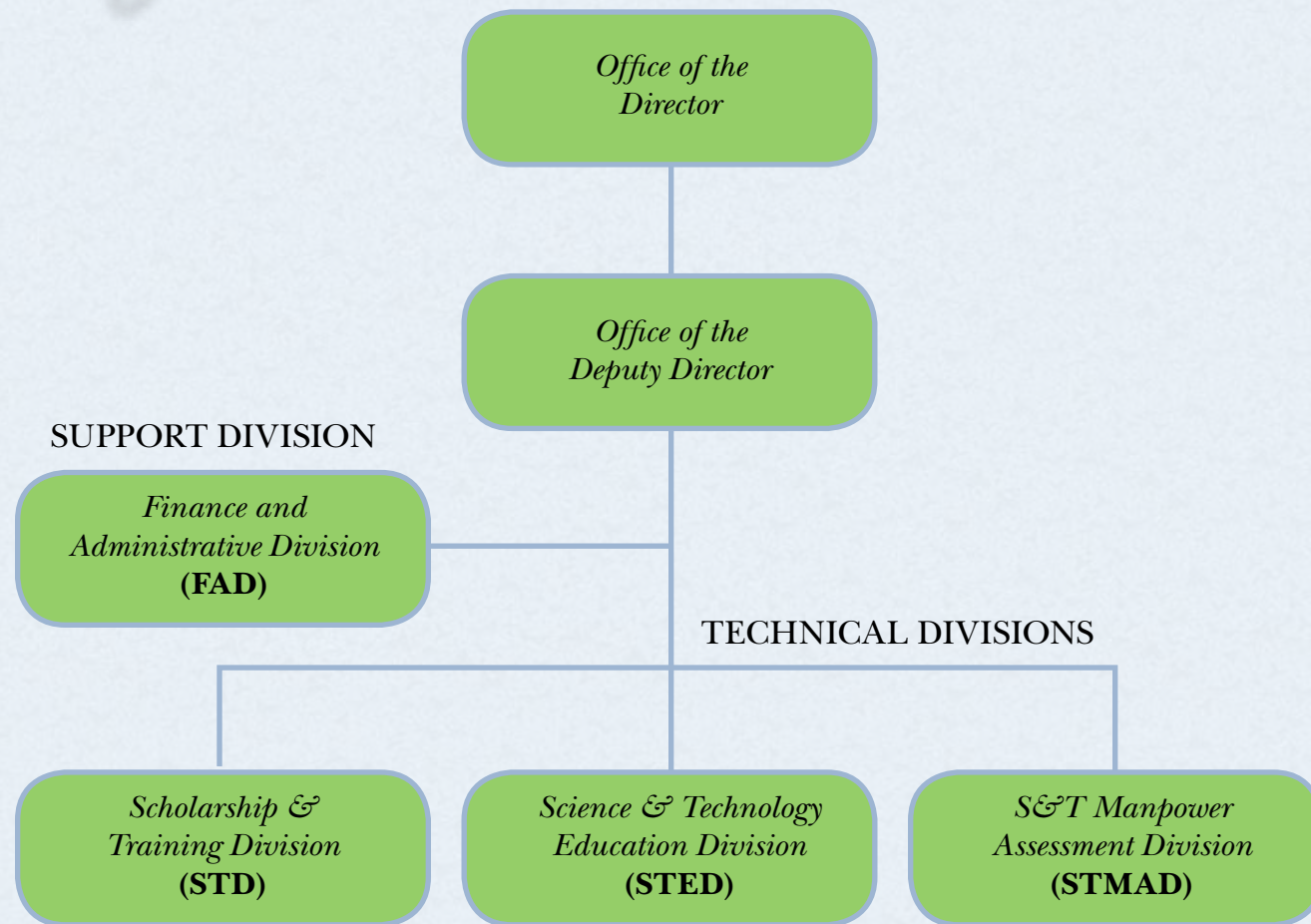


# Logical Framework





# Organizational Chart



## Key Officials of SEI



**Ester B. Ogena, Ph.D.**  
Director



**Leticia V. Catris, Ph.D.**  
Deputy Director



**Alice L. Asuncion, MPM**  
Division Chief  
Scholarship & Training  
Division



**Lilia R. Lauron, MAT**  
Division Chief  
S&T Education Division



**Ruby R. Cristobal, MPS**  
Officer-In-Charge  
S&T Manpower Assessment  
Division



**Aida T. Ayran, MBM**  
Division Chief  
Finance & Administrative  
Division

# Officers & Staff







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