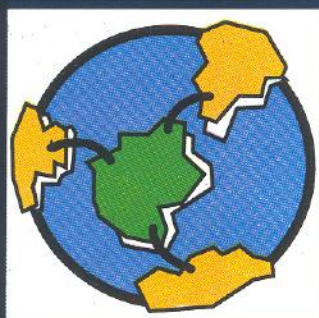


SCIENCE EDUCATION INSTITUTE



ANNUAL
report



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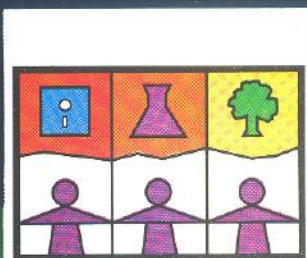


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MESSAGE

The hallmark of the 1994 accomplishments of the Science Education Institute (DOST) is the growing number of DOST-SEI scholars — an indication of the youth's renewed interest in Science and Technology (S & T).

With the number of outstanding scholar-graduates increasing year after year, SEI finally gained the overwhelming support of the country's legislators with the swift enactment of Republic Act 7687, or the 1994 S & T Scholarship Act. This measure provides for a five-year, full-blast manpower development effort in S & T by substantially increasing annual allocation for tertiary level scholarships in critical fields (including post-secondary technician courses) as determined by the foreseeable demands of the emerging industries.

The year under review has also seen the growing interest of the private sector in supporting government programs for human resource development. As encouraged by the present administration, the non-government organizations and the private sector have assumed a different role in nation-building. With several programs receiving substantial contributions from these organizations, private sector-government partnership has been realized in the field of science education.



A Cooperation Program with JICA for the establishment of three model Regional Science Teaching Centers (RSTCs) was also forged. This program covers grants for science training facilities and laboratory equipment, overseas science administrators' training, and the sending of volunteers, all intended to strengthen the capability of the country's RSTCs.

Continuing programs in undergraduate scholarships, teacher education, youth-oriented science promotion, S & T culture development and R & D support for the improvement of science education were also implemented to sustain the supply of competent manpower in various fields.

These and many more were achieved in a year's time as the Institute's valuable contribution to attaining a globally-competitive economy by the turn of the century. Committed to its mandate to uplift science and technology literacy in the country, SEI will continue to expand its reach through more cooperative local and international programs in the future.

ESTER B. OGENA, Ph.D.

Director

HIGHLIGHTS

Among the many activities and projects pursued in 1994, the following are considered major accomplishments, owing to their scope and impact relative to the Institute's objectives:

Science and Technology Education Plan

Approved by the Science and Technology Coordinating Council in 1993, the Science and Technology Education Plan (STEP) entered the implementation stage in 1994. STEP provides the framework for the effective use of science and technology as a means of achieving sustainable development.

Republic Act 7687

In response to the country's need for an increased number and improved quality of S & T manpower, this program - also known as the Science and Technology Scholarship Act of 1994 - was enacted. This Act provides financial assistance for the education of poor but deserving students. Qualifying examinations for the initial implementation of this program were administered in 1994.

Gawad AGKATEK

The Gawad AGKATEK (Agham, Kapaligiran at Teknolohiya) was launched in 1994 with the support of science clubs nationwide. The project promotes science, environment and technology in the lives of Filipinos at the community level. A search for outstanding community projects was the initial activity under the Gawad AGKATEK.

IEA Membership

DOST-SEI was accepted as a member of the International Association for the Evaluation of Educational Achievements (IEA). The membership paved the way for Philippine participation in the Third International Mathematics and Science Study (TIMSS) and other international studies, particularly on language and civic education.

JICA Support for Model RSTCs

The three model RSTCs selected were given a financial boost by a P320 million Grant-in-Aid from JICA. The grant covers the provision of science training facilities, laboratory equipment, as well as improved capability to train teachers.

President Fidel Ramos concretizes his support for S & T Manpower enhancement with R.A. 7687.



Dr. Elisa Paqueo-Arreza, a Gawad AGKATEK judge, examines the winning project of the Young Researchers from the Katipunan Central School.

SCIENCE AND TECHNOLOGY EDUCATION PLAN

A concrete and deliberate effort to produce the manpower needed to steer the country to the goal of attaining newly-industrialized status by the turn of the century is embodied in the Science and Technology Education Plan (STEP), which was drawn up by the Department of Science and Technology, Department of Education, Culture and Sports, University of the Philippines and the private sector.

The STEP was approved in late 1993 as a complementary plan of the Science and Technology Manpower Plan and serves as a guidebook for both policymakers and the implementors of the S & T education program.

Actually first implemented in 1994, the STEP was used as a guide for carrying out programs and

projects designed to provide the Philippines the cutting edge necessary for attaining NIC status--a scientifically literate and technologically skilled manpower.

The Plan takes off where previous efforts to improve the quality of science education, primarily with the Science Education Development Plan of the early 1980s up to 1990, have stopped. Putting STEP into operation is made easier by the fact that STEP was drawn up based on a series of studies assessing the state of science education in the country. It was framed on the basis of what are deemed to be serious gaps in the development of an S & T manpower stock in relation to the thrusts, targets and priorities of the Medium Term Philippine Development Plan and the Science and Technology Master Plan.

The Plan has set proposed targets for 1994-1998, all calculated to meet the needs of both the teacher and learner in the three levels of education and improve the delivery system of science teaching. Projects, programs and other activities under STEP fall into seven major categories.

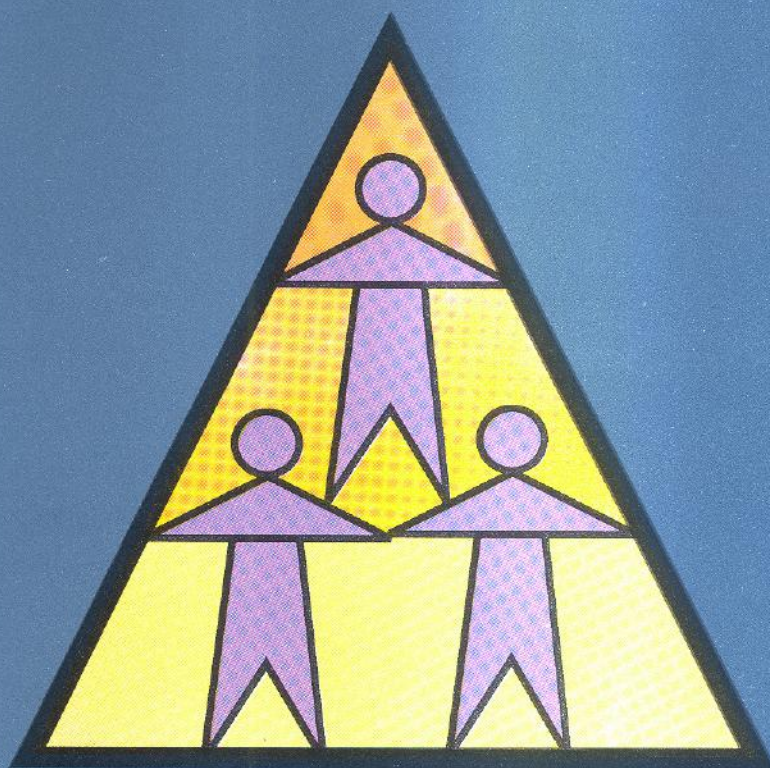
The past year saw the successful implementation of projects and programs in the different categories outlined in the plan, including such areas as Curriculum/ Instructional Materials Development, (Faculty/Staff) Manpower Development, Physical Facilities/Equipment and Alternative Learning Systems.

A visual summary of the Institute's main areas of concern under

STEP: the SEI display booth at the National Science and Technology Week Exhibit held in July at the Philippine Trade and Training Center.



DEVELOPMENT OF SCIENCE AND TECHNOLOGY INFRASTRUCTURE



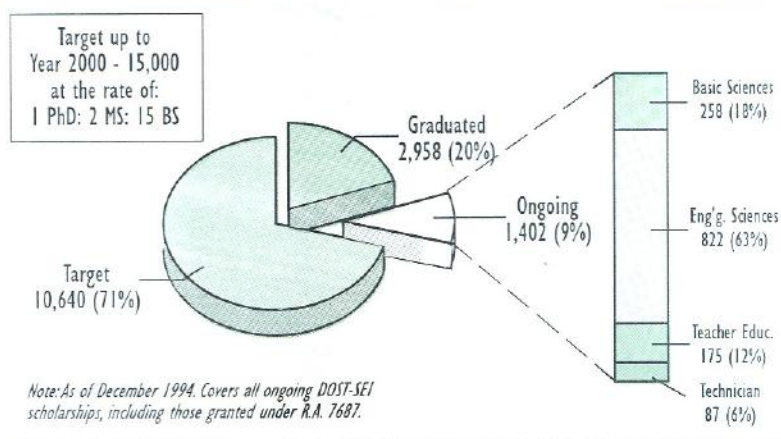
SCIENCE & TECHNOLOGY
MANPOWER DEVELOPMENT

As part of its role in developing the future generation of science and technology manpower, the Institute has pursued several projects aimed to harness potential S & T educators and enhance the quality of the current crop of teachers and students in all levels. The SEI has also vigorously pushed for the support of government in terms of relevant legislation, and private sector support as well. Accomplished in the 1994 agenda were the following:

S & T Undergraduate Scholarships

There is a wide range of scholarship slots available from the Institute. In 1994, slots were granted under the following programs: the Undergraduate Scientific Manpower Development Program or Project 5801 Ed., the Junior Level Assistance Program in Engineering (JLAP), Cooperative Pre-service Education and Partial Scholarships, Scholarship Program for Science and Mathematics Education, the NAPOCOR Educa-

Proportion of Ongoing
S & T Scholars to the
Target Number for the
Year 2000



tional Financial Grant and the DOST-SEI-Shell Scholarship Program.

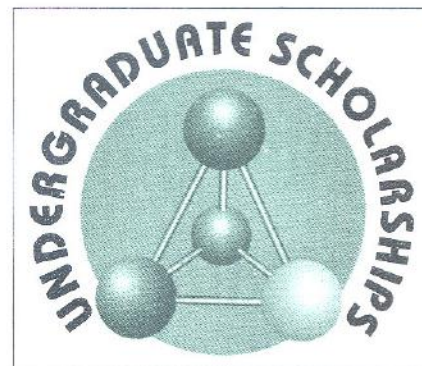
For AY 1994, 979 scholars under Project 5801 Ed. and JLAP were monitored and evaluated. A total of 327 students were also awarded scholarships for AY 1994-1995; 270 under Project 5801 Ed. and 57 under JLAP.

These scholars were encouraged to join several activities for their continuous development: Guidance and Counselling; Lectures, Workshops and Exhibits; Summer

Practical Training and the Science Interblock Quiz.

Under the Cooperative Pre-service Education and Partial Scholarships, 36 scholars completed their academic programs in March at the Philippine Normal University. Eighteen of them received honors, two topped the 1994 Professional Board Examination for Teachers (PBET) given in May, and another placed second in the special PBET administered in October. Of those monitored, at least 42% of the graduates were employed in public secondary schools, while 28% secured jobs in private institutions. Twenty-two junior scholars participated in the summer enrichment training program in Science and Mathematics at the UP-ISMED from May to June, while 21 senior scholars took part in an off-campus teacher training from November 1994 to January 1995 in the S & T-oriented high schools in the country.

For AY 1994-1995, SEI provided assistance to its new awardees and continuing scholars.



Designed primarily for physics majors, the Scholarship Program for Science and Mathematics Education, on the other hand, supported 58 BSE scholars (29 of them continuing and 29 new awardees) in various RSTCs. Among the 23 scholars who completed their courses at the end of AY 1993-1994, one graduated magna cum laude and four finished cum laude. Four of these new graduates were absorbed in public secondary schools effective AY 1994-1995, and still another four obtained employment in private schools.

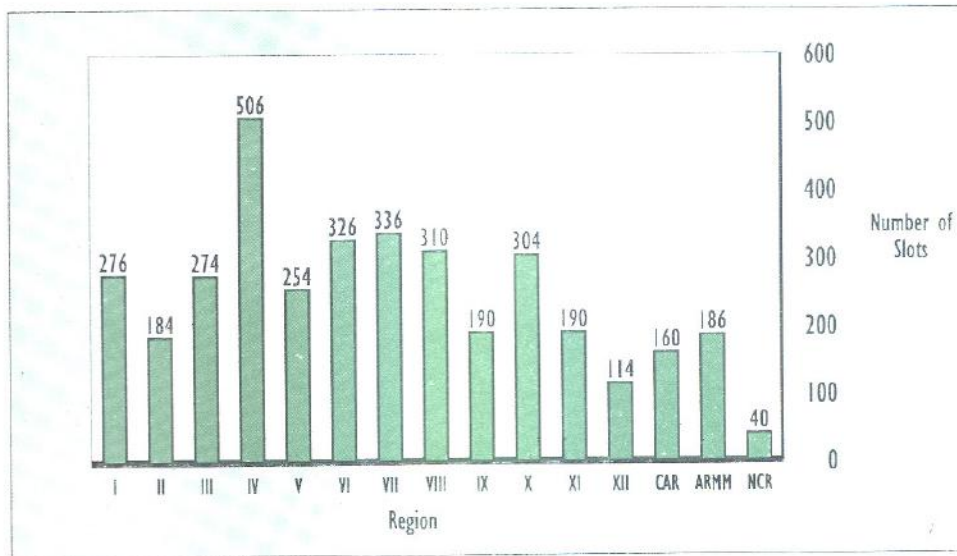
Eight sophomore students also benefitted from the Napocor Educational Financial Grant: seven from MSU-Marawi City and one from Xavier University. In the 1994 JLAP examination,

there were 10 examinees from MSU-Marawi, but only one qualified—junior mechanical engineering student Ehmer Dimacaling who received the following benefits under the grant: actual tuition fees, monthly living allowance for 10 months, PE/MS uniform and one round-trip ticket from place of study to residence per academic year.

Moreover, as a way of providing assistance to deserving students who were not enrolled as full-time DOST scholars, the Institute selected and endorsed 14 BSE students to the Pilipinas-Shell Foundation, Inc. (PSFI) for a two-year financial assistance grant. The Philippine Normal University, where the students were enrolled, cooperated with DOST-SEI for the monitoring and evaluation of the scholars' performance. PSFI, for its part, shouldered the scholars' expenses—actual tuition fees, monthly transportation and book allowance.

1994 Science and Technology Scholarship Act

Also known as Republic Act (R.A.) 7687, this Scholarship Act aims to strengthen the Philippines' science and technology manpower by granting financial assistance to poor but talented students who intend to pursue a degree or diploma program



in science and technology.

The program was initially implemented in the 19 poorest provinces in the country, with qualifying examinations administered to 1,608 students in 19 test centers in April. Scholarships for Academic Year (AY) 1994-1995 were granted to 237 students under the BS program, and to 108 in the Technology program, or a total of 345 comprising the first batch of beneficiaries.

Facilitating initial implementation in 1994-1995 were two donations: P2 million from the Philippine Amusement and Gaming Corporation (PAGCOR) and P6 million from the DOST-Grant-in-Aid fund.

In November 1994, examinations were administered to 13,147 high school seniors in preparation for AY 1995-1996. Held in 75 test centers nationwide, the tests were preceded by an information campaign supported by the Kapisanan ng mga Brodcaster sa Pilipinas and the Philippine Informa-

Regional Distribution
of Scholarship Slots
(R.A. 7687)

tion Agency which gave free air time for announcements in four TV and 30 radio stations nationwide

CIP for DOST-SEI Scholar Graduates

Aware of the scholars' need to secure gainful employment after graduation, DOST-SEI facilitates their entry into agencies or institutions where they can practice basic or applied science through its Career Incentives Program (CIP). For 1994, 20 slots for the research-trainees in the DOST system - the main office, various DOST regional offices, sectoral councils and research and development institutes - were made available. The CIP slots for 1994 were filled by 11 scholars, five of whom trained in the Regional Offices, four in the ITDI, and one each in PCASTRD and ASTI.

Another form of assistance offered to the graduate-scholars came in the form of a joint SEI-DECS effort: Memorandum No. 140, S. 1994. Issued to all DECS and DOST regional offices, it strongly endorses the placement and acceptance of new graduates to teaching jobs or employment, particularly in public secondary schools in their respective regions.

On the other hand, 20 scholar-graduates benefitted from the DECS and CSC Office Memorandum No. 50, S. 1994. Employed in public secondary schools and in the S & T-oriented high schools, six of these scholar-graduates availed themselves of the three-month salary under the DOST-SEI CIP.

DEVELOPMENT OF SCIENCE AND TECHNOLOGY INFRASTRUCTURE



STRENGTHENING OF
REGIONAL CAPABILITIES

Even as strides are being made in manpower development at the national level, there are also continuing efforts to ensure a strong S & T infrastructure at the regional level. These efforts take such forms as institution-building programs, recognition activities and curriculum development.

Institution-building

Teacher training, scholarships and facility or equipment grants were also actively pursued by the Institute in its bid to boost the effectivity of the teaching-learning process, and to help support the network of 110 S & T-oriented secondary schools in the regions.

Proportion of Trained/
Qualified Science and
Mathematics Teachers
and the Target Number
for the Year 2000

Training Program for Elementary Teachers

To enhance the competence of elementary science and mathematics teachers in the feeder elementary schools, a short-term training program

Certificate Program for Secondary Teachers

A two-summer certificate program was conducted to provide the secondary science and mathematics teachers with knowledge on content essential to teaching science subjects. This program is intended for teachers who teach science and mathematics but do not hold a degree of specialization in these fields.

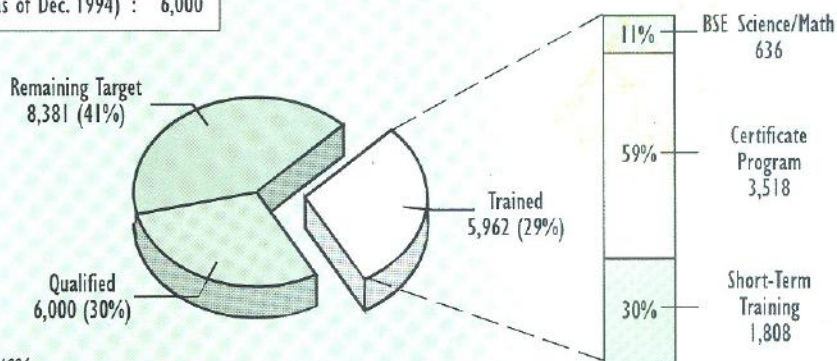
For 1994, emphasis was given to two-major fields or what is also known as the double-concentration curricula. The specialization is a combination of two science- or mathematics-related subjects.

The program trained 1,065 secondary science and mathematics teachers in the RSTCs. After earning 18 units, equivalent to a major in science in the undergraduate level, 470 of them graduated. The other 595 completed the first phase of their training.

Faculty Development Program for RSTCs

The Ph.D in Science Education Program for the faculty members of the RSTCs started in 1989 at the U.P. College of Education or UPCE. Its objective is to upgrade the teaching capabilities of the faculty in RSTCs; scholars are expected to share their learning with the prospective teachers enrolled in the UPCE. They are also

- Trained (as of Dec. 1994) : 5,962
- Target (for the year 2000) : 20,343
- Qualified (as of Dec. 1994) : 6,000



As of December 1994

was designed for them. This program was implemented in the summer of 1994 in the RSTCs.

The 713 participants were mostly fifth and sixth grade teachers from the feeder elementary schools of the 110 S & T-oriented high schools nationwide.

expected to improve their expertise in training teachers being served or trained by the RSTCs. In general, this program is intended to ensure a fair supply of competent educators in each region.

The program is being implemented by the UPCE and De La Salle University (DLSU). UPCE admitted 37 participants (Batch 1989, 13 slots; Batch 1991, 12 slots; Batch 1993, 12 slots), while DLSU accepted 25 participants (Batch 1992, 14 slots and Batch 1994, 11 slots). By the end of 1994,

there were 23 scholars at UPCE and 24 at DLSU.

Of the 1989 scholars, two each from chemistry and mathematics have finished the program, while three others have completed the physics program. From 1991, two for mathematics have so far finished.



completed the physics program. From 1991, two for mathematics have so far finished.

Grant-in-Aid for RSTCs

As part of its two-year program, the DOST (through SEI) released P25.4 million Grant-in-Aid to the 14 RSTCs nationwide. Part of the Manpower Development Program of DOST which aims to strengthen the regional capabilities of the RSTCs, the fund is used to buy equipment facilities, curriculum materials and teaching aids for use in training programs in RSTCs.

The RSTC in Central Luzon State University, being newly-established, received P 2 million, while the 13 others received P 1.8 million each. DOST Secretary Dr. William Padolina distributed the P1.8 million individual cheques during awarding ceremonies at the DOST Executive Lounge. On hand to receive the grants were the presidents of universities where the RSTCs are based.

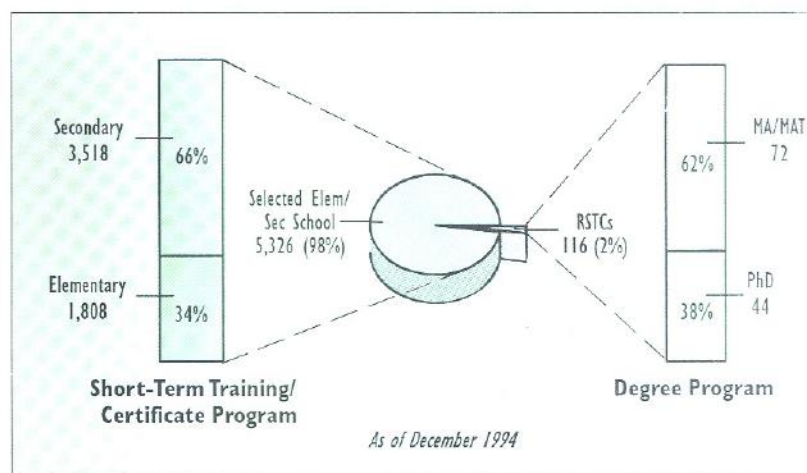
Recognition of Outstanding Scholars

While the aforementioned scholarships and grants for future and current teachers are an integral part of institution-building, there is another aspect which, though not as critical as the actual tasks directly involved in institution-building, contributes greatly towards motivating more participants in the development of S & T competency in the country. This entails recognizing graduating scholars of DOST-SEI programs, particularly those who have achieved excellence in their designated fields.

Recognition ceremonies have become part of the Institute's agenda of activities at the annual National Science and Technology Week celebration. For 1994, the event was held at Innotech in July, with 66 graduates getting medals of academic excellence.

Among these graduates, six finished Summa Cum Laude, five finished Magna Cum Laude, 54

Proportion of Trained/
Graduated Science and
Mathematics Teachers
Per Course/Training



Cum Laude, and one received a silver medal. Eight other scholars finished their courses earlier than the period prescribed for completion. Three other scholars were given recognition for copping top slots in the 1994 Professional Board Examination for Teachers (PBET). Two of these scholars - Esperanza Almeda and Rosalyn Lozano - placed third and seventh, respectively, in the regular PBET

for 1994, and received substantial cash awards from the Metrobank Foundation. On the other hand, Marilou Apostol placed second in the special PBET for 1994.

Curriculum Development

Here, the main task is to improve the quality of science and mathematics subjects in the three educational levels. The focus is on upgrading and modernization of the subjects' content, as well as the introduction of supplementary or enrichment materials.

Curriculum for Special Science Classes

SEI, working with experts in academe and the DECS, designed and drafted a special science curriculum for the Special Science Classes (SSC) in the S & T-oriented high schools. The SSC curriculum was created to cultivate and enrich science, mathematics and technology skills among secondary school students. This is meant to prepare them for embarking on science-related courses and professions.

A balanced mix of enrichment topics, activities and materials were provided for science and

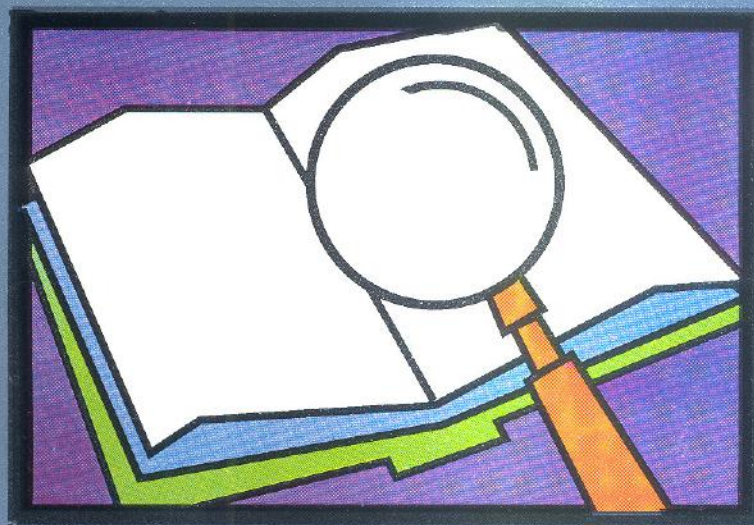
technology, mathematics and Earth Science subjects in all year levels. Supplementary enrichment materials for the second year level (S & T II and Mathematics II) have been printed and are ready for distribution.

Technology-Based Curriculum

Further enhancement of secondary-science education was sought with the development of a technology-based curriculum. DOST-SEI, DECS-BSE and the Philippine Science High School (PSHS) worked on the curriculum which was pilot-tested at the PSHS, Quezon City Science High School and the Pablo Borbon Memorial Institute of Technology High School. Envisioned for expansion to the 110 special science high schools, the curriculum provides for electronics, metal and carpentry shops not found in the regular science laboratory.

Upgrading of these schools' existing facilities and equipment was also undertaken by SEI to ensure successful implementation of the curriculum.

DEVELOPMENT OF SCIENCE AND TECHNOLOGY INFRASTRUCTURE



CAPABILITY-BUILDING IN
SCIENCE EDUCATION RESEARCH

The result of a multi-agency effort led by the SEI, the S & T Education Plan or STEP also covers the establishment of information systems on science and technology education. Monitoring and evaluation are two of the major tasks included in this area; the development of a Management Information System for science education is another.

S & T Manpower Assessment

The Institute makes it a point to pursue survey or assessment programs. Decisions for future program planning, development and implementation are based on the results of these assessment programs. The bulk of SEI's assessment work takes the form of monitoring and evaluation; for 1994, the following three areas were stressed.

1. Assessment of S & T Manpower
Resources: Gathering secondary data from the National Statistics Office
2. Coordination and Monitoring of Student Performance in S & T-oriented Schools: School and faculty profile; Affective characteristics of students in special science classes; Test administration and evaluation of students' achievement/performance
3. R & D Support for the Improvement of Science Education in the Country:
Grant-in-Aid program for action researches

SEI in TIMSS

To be conducted in 50 nations, the Third International Mathematics and Science Study (TIMSS) is a ten-year study program to review the science and mathematics curricula.

Sponsored by the International Association for the Evaluation of Educational Achievements (IEA) TIMSS will guide policymakers in choosing the best teaching approaches and methods to improve the learning process. The cumulative effects

of improved science and mathematics education is envisioned to impact on the economic development of the countries involved.

A meeting of the National Research Coordinators (NRCs) for TIMSS was held in August at the TIMSS Study Center in Boston College in Massachusetts, USA. The NRCs for TIMSS Philippines, Dr. Ogena and UP-ISMED Director Dr. Milagros Ibe, attended the meeting. The tests, questionnaires and performance assessment tasks (earlier pilot-tested among a sample of Filipino students) were



SEI Director Dr. Ogena at the 35th IEA General Assembly, where Philippine membership in IEA and participation in TIMSS were confirmed.



finalized and approved by the TIMSS Boston College Technical Staff. DOST-SEI, together with the DECS and UP-ISMED, will undertake full-blown administration of the tests in the Philippines.

For six months, a study on the mathematics and science learning and performance of the two study populations will be done using the TIMSS-developed testing instruments. The two populations involved are composed of second and third graders (for the nine-year-old population) and grade six and first year high school students (for the 13-year-old population). The survey is scheduled for implementation in 420 schools all over the country in 1995.

The forum at De La Salle University: SEI-STMAD Chief Dr. Filma Brawner; forum participants.

Data Generation from the NSO Census

The Institute, through its linkage with the National Statistics Office (NSO), was granted access to the Public Use File or PUF, a database system containing the results of the 1990 Census of Population and Housing.

The database contains personal and socio-demographic data of households surveyed all over the country. Also part of the PUF package is the Manual on Usage Documentation which describes the file layouts, coding schemes and other information relevant to the survey. Approximately more than three million records can be extracted from the census' file; the file can process the data based on the specification requirements needed by the Institute.

A primary use of the database could be to yield quantifiable data on potential S & T manpower stock.

Coordination and Monitoring of Students' Performance

Given the task of supervising the assessment of manpower needs and utilization, the SEI monitored and evaluated the implementation of the Science and Mathematics-Enriched Curriculum in the network of 110 S & T-oriented high schools.

Two sets of examinations were administered in 1994. The first set was the 1994 Achievement Test with 160 items distributed among the areas of mathematics, science and English. The test was administered to evaluate the performance of the first year students enrolled in AY 1993-1994. Of the 14,854 examinees, 9,038 (61%) belonged to the special science class, while 5,816 (39%) were from the regular SEDP classes which served as the comparison group.

The second set of exams came as the 1994 Selection test for the second batch, administered to the elementary school graduates seeking admission to the science-oriented high schools for AY 1994-1995. Of the 14,628 examinees, 7,687 (53%) qualified for the special science classes.

Other indicators such as participation effects, attainment effects, achievement effects and equity effects are being developed for further analysis and interpretation of the data generated from the examination results.

R & D Support for the Improvement of Science Education

Problem identification and resolution are two key areas in the Institute's efforts towards improving science education in the country. Thus, the Institute implemented a Grant-in-Aid program for R & D support for the improvement of science education.

A means of cultivating the research capabilities of teachers in the country's S & T-oriented high schools and node institutions, the program encouraged teachers to submit a research proposal that



could contribute to the enhancement of science teaching or science education as a whole.

A forum was held last July at the De La Salle University in order to disseminate the findings of the researches done in 1992-1993. Some 300 people - mostly publishers, teachers and school officials - attended the forum where seven selected researches were presented by their proponents.



Efforts are underway to reach more teacher-researchers through the publication of the researches and the production of print and video materials on how to conduct researches.

USIP Seminar-Workshop

Conducted in the country's 14 regions, the Seminar-Workshop on Undertaking Science Investigatory Projects (SW-USIP) targetted students and science club advisers. Working in dyads, these participants were taught the skills necessary to undertake science investigatory projects and produce research proposals, and were also oriented as to the mechanics of putting up a Science Fair. Discussed during the seminar-workshop were the following:

Identifying Researchable Problems (Formulating Research Problems, Hypothesis and Research Design)

- Collecting/ Recording/ Analyzing Data
- Making Recommendations/ Conclusions
- Writing of Abstract
- Presenting/ Defending the Project Proposal
- Critiquing (Mock-up Science Congress)
- Conducting A Science Fair

An average of more than fifty participants per region attended the said seminar-workshops.

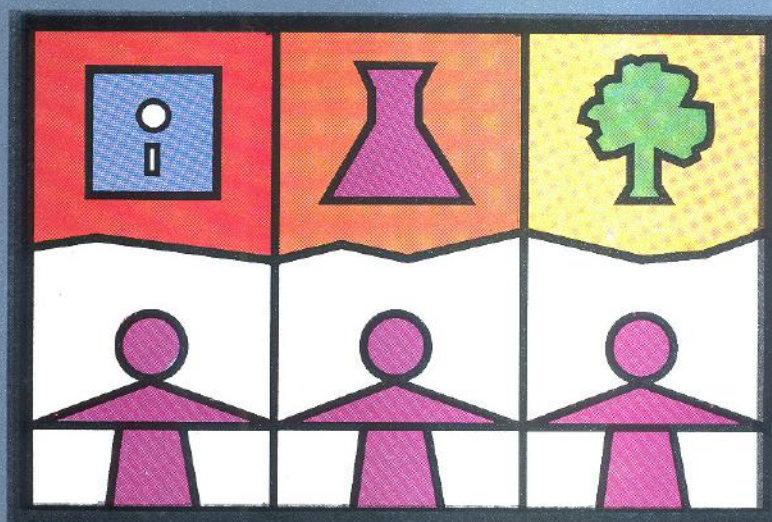
Conference on Research Agenda for Science Education

A Conference on Research Agenda for Science Education was held as part of the celebration of the National Science and Technology Week last July at the UP-ISMED. Organized to identify trends and directions in science education research, the conference also became the forum for the formulation of a research agenda.

Various universities were represented by their Vice Presidents for Academic Affairs, Deans of Graduate Schools, and Deans and Directors of the Colleges of Science and Education. Participants were grouped into four, to tackle four research areas and come up with lists of possible topics for research which could be undertaken by students in the master's and doctoral degree programs. The four research areas identified were: the teaching/learning on science and mathematics; curriculum development; instrumentation and evaluation in science and mathematics; and multidisciplinary approach to science.

Participants in the
Conference on
Research Agenda for
Science Education.

DEVELOPMENT OF SCIENCE AND TECHNOLOGY INFRASTRUCTURE



PROMOTION OF SCIENCE & TECHNOLOGY
CULTURE

The Institute continued its commitment to promote an S & T consciousness, particularly among the youth, employing a variety of non-traditional methods outside of the typical class room setting. An important addition to the usual activities was the Gawad AGKATEK. The project has the added value of promoting not only S & T awareness but environmental concern as well -- and both of these at the community level.

Gawad AGKATEK
awarding rites in
Malacanang, with
President Fidel Ramos
as Guest Speaker. Also
in photo are DOST
Secretary Dr. William
Padolina and NSCM
National Executive
Committee Chairman
Senator Orlando
Mercado.

Gawad AGKATEK

Launched in April during the National Science Club Month celebration, the first Gawad AGKATEK was held, designed as a search for outstanding community projects.

The project encouraged the involvement of the 2,500 science clubs nationwide, with an estimated total membership of 250,000. A hundred and seven project-entries were submitted for evaluation. Of these, three best projects were selected at

Second Place: "Soil and Water Conservation"

by the CNHS Science Club of Colawin National High School, Colawin, Argao, Cebu

Third Place: "Tanim Kawayan" by the

DRAHSECS Science Club of D.R. Aguinaldo High School, Matina, Davao City

Philippine Mathematics Olympiad (PMO)

Launched in 1984, the PMO has provided a good source of talented students who undergo intensive training for the International Mathematics Olympiad (IMO). The 1994 PMO was held across school divisions with 40,000 high school participants, 5,278 of whom received certificates of achievement for obtaining a cut-off score of 20. Close to 1,300 third and fourth year students joined the regional competition; the highest ranking individuals and school teams (5 each for NCR, Luzon, Visayas and Mindanao) will compete in the 1995 national level.

Supporting the PMO is the Program of Excellence in Mathematics (PEM), a DOST Grant-in-Aid program of intensive mathematics training being conducted at the Ateneo de Manila University (with three other PEM training centers located in Baguio, Cebu and Iligan). Those of the 134 student-trainees (from NCR) who perform remarkably will participate in the IMO scheduled for July 1995 in Canada.



the regional level. The first placers in each of the 14 regions vied for the first three places at the national level. Receiving top honors during the awarding ceremonies held in September in Malacanang were the following national winners:

First Place: "Promotion on Nursery Enterprise for Asexually Propagated Mangoes" by The Young Researchers of Katipunan Central School, Katipunan, Zamboanga del Norte

Australian Mathematics Competition (AMC)

An invitational correspondence contest for the Asia-Pacific region, the AMC test was administered locally by Dr. Jose Marasigan of the Mathematics Society of the Philippines and the SEI staff.

Bernard Chan, a senior student from the Grace Christian High School, became one of 36 Westpac medalists among the 520,000 entrants from the participating Asia-Pacific secondary



Westpac medalist
Bernard Chan receives
his award from
Australian Ambassador
Richard Smith as DOST
Secretary Dr. William
Padolina watches.

schools. Fifteen Filipino students also received the Certificate of Distinction while 35 received the Certificate of Credit from the AMC Trust for their performance. Australian Ambassador Richard Smith and DOST Secretary Dr. William Padolina presented the awards to Chan at the Australian Embassy.

International Mathematics Olympiad (IMO)

The 1994 International Mathematics Olympiad (35th IMO) was held last July in Hong Kong. The country was represented by a delegation of eight mathematicians composed of a Team Leader, a Deputy Team Leader, and six student-contestants. One of the country's participants, Glen Ong, garnered an honorable mention award.

Philippine Physics Olympiad (PPO)

One of the projects under the DOST Grant-in-Aid program, the PPO aims to identify and en-

courage students who excel in physics to pursue S & T courses (especially physics), and improve physics education in the country.

Of the 5,954 students who joined the 1993-1994 PPO, 54 qualified in the inter-regional meets which took place simultaneously in Baguio, Dumaguete, Davao, and Quezon City.

About one percent (68 students) of the PPO participants received Certificates of Merit for obtaining a division test score of 50% or better. Sixteen inter-regional participants made it to the national finals individual competition at the UP-ISMED to take part in the intensive training provided by the Program of Excellence in Physics, in preparation for the country's participation in the International Physics Olympiad.

Winners received cash prizes, plaques, medals, and trophies.

Philippine Participation in the 25th IPHO

After being granted participation in 1993, the Philippines was able to join in the 1994 International Physics Olympiad (IPHO) held at Beijing, China in July. The country's delegation was composed of two team leaders and four student-contestants who participated both in the theoretical and practical tests of the contest.

Support to the Regional Science Centrum

Considered an effective tool in enhancing interest in science among the school age population, science centruns house interactive exhibits which provide both students and out-of-school youth with a venue for learning science outside the classroom setting and in a non-traditional way.

The country now has 10 of these centruns (two each in Metro Manila, Luzon and Visayas, and four in Mindanao); more of these are expected to be established with the cooperation of the private sector, NGOs and the local government units. The SEI

has been supporting several of these, namely, the Eastern Visayas Science Exploratorium, the Oro Science Centrum, the Davao Science and Technology Centrum and the Zamboanga Science Centrum. This support supplements the bigger effort of the DOST through its Grant-in-Aid program. Since 1992, more than P9 million has been released by the SEI and DOST to support the regional science centrums.

The construction of the Bicol Regional Science Centrum by the Naga City Government began in 1994. The local government gave contributions amounting to P4 million, including land and the construction of a building with exhibit space. There are plans for the centrums' link-up with the international network of science centrums.

Workshop for the Young Women Researchers

A two-day organization workshop for young women S & T researchers was held in December at

selves, acquire technical knowledge to improve their S & T projects, tap their leadership potentials, inform them of relevant issues, and most importantly, to encourage them to embark on an S & T career.

Lecturette discussions covered Empowerment and State of Filipino Women, Enhancing Leadership Potentials and Developing Assertiveness Skills, Role of Filipino Women in S & T Development, Gender Data and Issues on Science Education. There was also a career talk on Biological and Engineering sciences, and a group consultation on how to improve individual research projects.

Participants were awarded certificates; two were chosen as members of the Philippine Delegation to the 4th World Conference on Women, to be held in Beijing, China in September, 1995.

The Outstanding Youth Science-Researchers (TOYS)

Secondary level winner
Joshua Arquero
receives his trophy
from PSFI Executive
Director Facundo Roco.
Also in photo:
Approtech Asia
Director Lilia Ramos,
Arquero's adviser and
SEI Director Dr.
Ogena.



▲
Workshop participants
discuss their responses
to an assertiveness
test.

the DOST Executive lounge, attended by 28 female participants: Approtech Asia awardees, student leaders, outstanding sophomore or junior high school students from public and private schools and freshmen DOST scholars.

The workshop aimed to motivate and encourage the participants to take interest in scientific researches, develop good fellowship among them-



Another youth-oriented science competition is the 1993-1994 National Search for The Outstanding Youth Science-Researchers (TOYS) which was held at DECS-RELC, Marikina in February. There were 31 entries from the different regions. Top three winners in the elementary, secondary, and tertiary levels were chosen by the Board of Judges; the only participant in the college level was chosen as the third placer in this category.

DEVELOPMENT OF SCIENCE AND TECHNOLOGY INFRASTRUCTURE



STRENGTHENING LINKAGES

Fully recognizing the value and immensity of its work, the Institute has made it a point to tap other sectors and maximize all available resources to achieve its objectives. These sectors include corporations as well as local and international groups committed to furthering science education and learning.

Some Local Linkages: the Private Sector

Support for the DOST-SEI's mandate came in widely-varying forms in 1994. From the local business sector, the Pilipinas-Shell Foundation and NAPOCOR both gave financial assistance for the tuition and other school-related expenses of more than 20 students.

Philippine Airlines donated the round-trip tickets of the eight IMO team members sent to Hong Kong.

Assistance also came from DIWA Learning Systems which donated trophies and plaques awarded to the winning communities in the first Gawad AGKATEK.



**ENGINEERING
AND SCIENCE
EDUCATION
PROJECT**

DOST-SEI and other DOST Agencies

On the other hand, DOST-SEI continued the implementation of the DOST-Engineering and Science Education Project.

Begun in 1992, the project represents the synergy between SEI and three other DOST agencies: the Philippine Council for Advanced Science and Technology Research and Development (PCASTRD), the Philippine Council for Industry and Energy Research and Development (PCIERD), and the Technology Application and Promotion Institution (TAPI).

By the second semester of AY 1994-1995, SEI achieved success in many aspects of the DOST-ESEP, among them its Master of Arts in Teaching (MAT) and Certificate/Diploma Programs (C/D Programs) in biology, chemistry, mathematics and physics for teachers in the 110 S & T-oriented high schools.

Of the grantees under the Master of Arts in Teaching (MAT) program, 37 (from the 21 selected node institutions) completed and finished their respective programs in biology, chemistry, mathematics and physics in two flagship schools--UP College of Education, Diliman and University of San Carlos, Cebu. Another 10 are working on their thesis.

Furthermore, more than 30 faculty were trained in the Computer-Aided Instruction (CAI) at UP-ISMED. This training was funded to prepare these node institutions' faculty in conducting similar training for the secondary school teachers, in preparation for the incorporation of computer courses and information technology in the special science curriculum. To ensure that the expertise and skills acquired in the said training may be practiced well, SEI through ESEP-PICO Procurement Unit awarded units of computers to the selected node institutions.

DOST-ESEP also includes C/D Programs to improve the teaching skills and competencies of science, mathematics and technology teachers in

the network of S & T-oriented schools. These C/D Programs are conducted in the 22 node institutions in the country's 14 regions.

All the 14 regions have successfully implemented the training in all the four fields of science teaching.

From AY 1992 - 1993 to 1993 - 1994, a total of 440 science and mathematics teachers were trained under the Certificate Program in biology, chemistry, mathematics and physics. On the other hand, 105 were trained under the Diploma Program in the same fields.

To date, there is a total of 505 science and mathematics teachers with enhanced teaching skills and competencies in the areas of science, mathematics and technology. These teachers now handle the science and technology courses in the Special Science Classes.

Also under ESEP, 25 units of New Science and Laboratory Buildings were completed, with a number of these now being used by the SSC students.

Construction of the second batch (63 units) started in September 1994, for completion by 1995.

RP Participation in International Studies Through IEA

SEI Director, Dr. Ogena, attended the 35th General Assembly of the International Association for the Evaluation of Educational Achievements (IEA) held in August in Yogyakarta, Indonesia. In the Assembly, the Philippines was accepted as an IEA member, paving the way for the country's participation in several major international studies. Among these is the Third International Mathematics and Science Study (TIMSS), which in the Philippines is being undertaken by DOST-SEI in cooperation with DECS and UP-ISMED. Local implementation of the other studies (on language and civic education) will be spearheaded by the DECS.

AIDAB and the WB-ESEP

With the endorsement of DOST-SEI, three doctoral students--Rosabel Abuan, Eden Ante and Ofelia Brioso-- were co-sponsored by the Australian International Development Assistance Bureau (AIDAB) and the World Bank-Engineering and Science Education Project (WB-ESEP) and received scholarship grants for the PhD. Enrichment Pro-



gram in Education at Monash University, Clayton, Victoria, Australia. Running from September 1993 to June 1994, the program, in keeping with its objectives, helped the students become more competent in doing their dissertation, with opportunities to use the library and other facilities (such as audio and video recorders and computers) of the host country while conducting research, and to interact

SEI staff (upper photo) and equipment supplier (lower photo) show the workings of sample science equipment provided by SEI to the 110 ESEP high schools.

with Science and Mathematics Education and Research experts from other countries.

The participants enjoyed the full support and guidance of various members of the Monash University faculty during all three phases of the program (research problem and methodologies development; data gathering; data analysis and dissertation writing).

JICA Support for Model RSTCs

A proposal for the strengthening of the three model RSTCs was forwarded last August to the International Coordinating Committee (ICC), the Cabinet Committee chaired by Finance Secretary Roberto De Ocampo.

The proposal—presented by DOST representatives Undersecretary Amelia Ancog and SEI Director Ester Ogena—was approved by President Fidel Ramos, for endorsement to the Japanese government under the JICA Grant-in-Aid Program on Package Cooperation for the Development of Science and Mathematics Education in Secondary Schools.

The package covers building and equipment grant, training of science administrators in Japan, and dispatch of Japanese volunteers. The package includes P320 million for science training facilities and laboratory equipment for the three Model RSTCs: Bicol University in Legaspi City, West Visayas State University in Iloilo, and Ateneo de Davao University in Davao City.

A Memorandum of Agreement specifying the roles, responsibilities, and commitments of the RSTCs and DOST-SEI was signed in October.

The second component of the package provided for the training of science administrators in Japan. The following participated in the JICA Group Training Course on Educational Administration for the Philippines (held in Japan from May to June): Dr. Violeta Arciaga, Chief Science Research Specialist, SEI-DOST; Dr. Nora Licup, RSTC Director, Bicol University; and Mrs. Agatha Senina, Asst. Professor IV, West Visayas State University. The training was part of the Bilateral Technical Cooperation Program of the Government of Japan for 1994.

The third component of the package is the dispatch of volunteers to SEI and the three model RSTCs. This year, Japan Overseas Cooperating Volunteers (JOCV), one of the cooperators of the project under the Package Cooperation Program, dispatched volunteers to SEI and Bicol University. The Japanese senior volunteer who arrived in April was assigned in SEI to monitor the programs related to the assignment of JOCVs to the RSTC. In September, two volunteers, experts in the fields of chemistry and physics, were sent to Bicol University.

The representatives of the various institutions involved in this program signed a Memorandum of Agreement in November, specifying and describing their roles, duties and responsibilities.

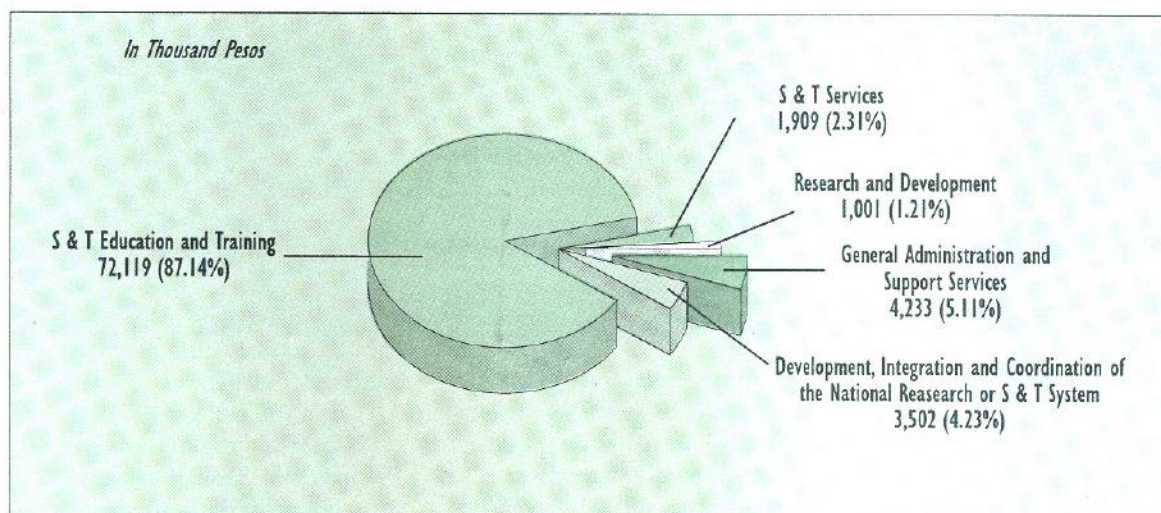
FINANCIAL SUMMARY

DISTRIBUTION OF EXPENDITURES* By Function and by Expense Classification, 1994

FUNCTION	P.S.	M.O.E.	C.O.	TOTAL
1. Research and Development	-	1,001,000.40	-	1,001,000.40
2. Technology Delivery	-	-	-	-
3. S & T Services Sub-Total	-	1,909,355.83	-	1,909,355.83
a. Information System	-	915,745.42	-	915,745.42
b. Technical Services	-	-	-	-
c. Science Promotion	-	993,610.41	-	993,610.41
4. S & T Education and Training	-	72,118,839.73	-	72,118,839.73
5. Development, Integration and Coordination of the National Research or S & T System	1,859,707.77	1,069,708.08	572,869.44	3,502,285.29
6. General Administration and Support Services	2,257,946.54	1,974,754.05	-	4,232,700.59
TOTAL	4,117,654.31	78,073,658.09	572,869.44	82,764,181.84

*NOTE: Includes all types of expenditures

Total expenditures for 1994 amounted to P82, 764,181.84. This total may be broken into the following major expenditure areas: Research and Development; Technology Delivery; S & T Services; S & T Education and Training; Development, Integration and Coordination of the National Research or S & T System, and General Administration and Support Services. Reflective of the Institute's continuing thrust towards developing a pool of competent S & T manpower, the area of S & T Education and Training once more constituted the highest expenditure share.



MANPOWER RESOURCES

In 1994, the SEI pursued all these activities towards the fulfilment of its mandate notwithstanding a lean staff: a manpower complement totalling 72. Of these, 38 are permanent; two are emergency staff while the remaining 32 work on a contractual basis and are considered Project Staff.

Nevertheless, the Institute continues to recognize excellent performance through awards and cash incentives.

1994 PERFORMANCE AWARDEES

NAME	AWARD/RECOGNITION	CASH BONUS
1. Emma Pasatiempo	Model Employee (Technical)	P5,000
2. Edwin Lopez	Model Employee (Adm. Staff-Support)	P5,000
3. Reynilda Garcia	Model Employee (Adm. Staff-Technical)	P5,000
4. Reynaldo Arceta	Special Performance Award	P5,000
5. Joel Parcon	Best Driver	P3,000
6. Josefina Fernandez	Completion of M.S. Degree	P3,000
7. Nicanor Cayabyab	Punctuality and Perfect Attendance	P1,000
8. Levita Portugal	Model Employee-STD (Technical)	P1,000
9. Jerry Florendo	Model Employee-STDP (Support)	P1,000
10. Reynaldo Arceta	Model Employee-STMAD (Technical)	P1,000
11. Dorcas Miraples	Model Employee-STMAD (Support)	P1,000

STAFF DEVELOPMENT PROGRAM

ASUNCION, MARINEL L.

- Opening Plenary & Technical Session (Hotel Nikko, July 18)
- 48th Annual Nat'l Convention of PICPA (Iloilo, Nov. 24-26)

AYRAN, AIDA T.

- Supervisory Management Functions (Taal Vista Hotel, Tagaytay City, March 23)
- 22nd Nat'l Conference on Public Personnel Admin. (Phil. Heart Center, June 1-3)
- PAGBA 3rd Quarter Membership Meeting and Seminar-Workshop (Venees Hotel, Davao City Sept. 8-9)

BRAWNER, FILMA G.

- Dev't & Formation of Personnel Policies and Systems Manual (HTDC, Makati, Oct. 3-5)

BUSTAMANTE, EDELMIRA B.

- Descriptive Statistics (Stat. Research Training Center, June 13-24)

CARTECIANO, JOSELITO A.

- Public Relations Management (Phil. Heart Center, July 26-28)
- 2nd Nat'l PR Congress Theme: Synergy Towards Nat'l Growth & Global Competitiveness (Hyatt Regency, Mla., Sept. 22-29)

CASTILLO, MA. TERESA P.

- Collection & Disbursement Functions (Mandaluyong, Jan. 29)

CAYANAN, LEAH SOCORRO AL

Refresher Course on Speech Writing (Manila, June 28-30)

CRISTOBAL, RUBY R.

- Improving Instructions in Science Through AV Materials (IRRI, Cavite, Jan. 10-12)
- Effective Publicity & Media Relations (Malate, Mla., Jan. 18)
- Comm. Res. & Evaluation

(Farm House, Batangas, June 2-3)

- Peaceful Applications of Nuclear Energy for Asia & the Pacific (Shangri La EDSA Plaza Nov. 29 - Dec. 1)

GARCELLANO, JOSEFINA D.

- Fundamentals of Records Mgmt. (Manila Hotel, Feb. 22)

IBRAHIM, ZAMORA E.

- Procedure in the Requisition & Procurement of Gov't Supplies, Materials and Equipment (Sulo Hotel, QC, Feb. 11)

MAGUYON, MA. CRISTINA C.

- Fundamentals of Records Mgmt. (Manila Hotel, Feb. 22)

MARAVILLAS, LUISA G.

- Emergency Purchases & Negotiated Contracts as Exemptions to Public Bidding in Gov't. (Sulo Hotel, QC, Feb. 5)
- Asset Disposal System and Procedures in Government (Sulo Hotel, Feb. 5)
- Inventory Custodianship, Accountability, Mgmt. & Utilization (Sulo Hotel, Feb. 12)
- Public Bidding Practices & Procedures (Sulo Hotel, Feb. 12)
- Seminar-Workshop of Planning Officers (Manila Manor Hotel, Pedro Gil, Manila)
- Problems & Issues in Public Bidding & its Resolutions (Westin Phil. Plaza, Sept. 24)
- Auditing Rules & Regulations on Revenues/Receipts and Expenditures & Disbursement of Gov't Funds (Westin Phil. Plaza, Oct. 1)

MENDOZA, GINA O.

- Taxation (Hotel Intercon Mar. 25)
- Opening Plenary and Technical Session (Hotel Nikko, July 18)
- Comprehensive Update on Expanded W/ Tax and Current

Dev'ts in W/Tax (Century Park Sheraton Hotel, Sept. 27)

- How to Handle Tax Audit and Investigation (Century Park Sheraton Hotel, Sept. 27)
- 48th Annual Nat'l. Convention of PICPA (Iloilo City, Nov. 24-26)
- Ass'n of Gov't Accountants of the Philippines (AGAP) (New Midtown Hotel, Dec. 1-2)
- W/Tax Laws and Regulations (BIR, Quezon City, Dec. 1)

MILAN III, FRANCISCO A.

- 20th Nat'l Convention & Election of Officers & Directors of the Phil. Inst. of Civil Engrs. (Mla. Midtown Hotel Nov. 10-12)
- 6th DLSU Computer Conference (DLSU, Manila, Dec. 2-3)

MUNCAL, IMMACULADA M.

- Fundamentals of Records Mgmt. (Mla. Hotel, Feb. 22)

ARCIAGA, VIOLETA N.

- Investing in the Phil. Stock Market (Phil. Heart Center, Quezon City, Nov. 29)

ORTALIZA, RODOLFO R.

- Purchasing Management (Makati, July 14-15)

PALATTAO, MARIETTA T.

- Fundamentals of Records Mgmt. (Mla. Hotel, Feb. 22)

PARCON, MONICA M.

- Emergency Purchases and Negotiated Contracts as Exemptions to Public Bidding in Gov't (Sulo Hotel, Quezon City, Feb. 5)
- Procedure in the Requisition & Procurement of Gov't Supplies, Materials & Equipment (Sulo Hotel, QC, Feb. 11)
- Asset Disposal System and Procedures in Gov't. (Sulo Hotel, QC, Feb. 5)
- Inventory Custodianship, Accountability, Management and Utilization (Sulo Hotel, QC, Feb. 12)
- Public Bidding Practices and Procedures (Sulo Hotel, QC, Feb. 12)

PARENTELA, RESURRECCION C.

- Opening Plenary & Technical Session (Hotel Nikko, July 18)
- 48th Annual National Convention of PICPA (Iloilo City, Nov. 24-26)

PASATIEMPO, EMMA M.

- Descriptive Statistics (Stat. Research Training Center, June 13-24)

PORTUGAL, LEVITA G.

- Emergency Purchases and Negotiated Contracts as Exemptions to Public Bidding in Gov't. (Sulo Hotel, QC, Feb. 5)
- Asset Disposal System and Procedures in Gov't

(Sulo Hotel, QC, Feb. 5)

- Public Bidding Practices & Procedures (Sulo Hotel, QC, Feb. 12)

RAFAEL, ELMA C.

- 30th National Conference of the Personnel Management Association of the Phil. (Baguio Country Club, Baguio City, Oct. 5-7)

REBUTA, VERGEL P.

- 6th DLSU Computer Conference (DLSU, Manila, Dec. 2-3)

REGALA, OLIVIA P.

- Fundamentals of Records Management (Manila Hotel, Feb. 22)

RIMORIN, LUZ S.

- The Laws' Regulations on Administrative and Judicial Sanction Imposed on Public Officials on Gov't. Officers and Employees (Sulo Hotel, QC, Feb. 5)
- 22nd National Conference on Public Personnel Admn. (Phil. Heart Center, June 1-3)
- Personnel Management (GSP Bldg., Tagaytay City, July 2-3)

- PAGBA 3RD Qtr. Membership Meeting & Seminar Workshop (Venees Hotel, Davao City, Sept. 8-9)

- 30th National Conference of the Personnel Management Association of the Phil. (Baguio Country Club, Baguio City, Oct. 5-8)
- Employees Performance Evaluation (DOST Executive Lounge, Dec. 5)

STA. MARIA, JOSEFINA S.

- Collection and Disbursement Functions (Madison, Mand., Jan. 29)
- Cash Examination (Madison, Mand., Jan. 29)

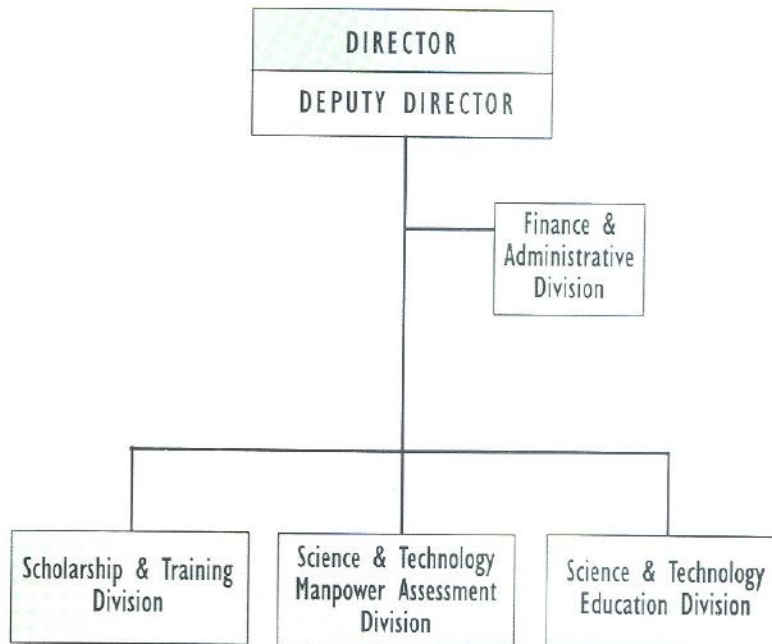
TOLENTINO, RAQUEL M.

- Association of Gov't Accountants of the Phil. (AGAP) (New Midtown Hotel, Dec. 12)

VIRREY, JUANITA G.

- Fundamentals of Record Management (Manila Hotel, Feb. 22)

ORGANIZATIONAL CHART



OFFICIALS

ESTER B. OGENA, Ph. D	<i>Director</i>
FILMA G. BRAWNER, Ph. D.	<i>OIC - Office of the Deputy Director and Chief, STMAD</i>
VIOLETA N. ARCIAGA, Ph. D.	<i>Chief, STED</i>
ELMA C. RAFAEL	<i>Chief, STD</i>
AIDA T. AYRAN	<i>Chief, FAD</i>



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