Republika ng Pilipinas
(Republic of the Philippines)
KINISTIT NG EDUKASYON, KULTURA AT ISPORTS
(MINISTRY OF EDUCATION, CULTURE AND SPORTS)
Maynila

April 11, 19[illegible]

MECS M E M O R A N D U M
No. 81, s. 1963

NATIONAL STUDY ON THE STATE OF SCIENCE EDUCATION IN THE COUNTRY

To: Regional Directors
Schools Superintendents
Presidents, State Colleges and Universities
Heads of Private Schools, Colleges and Universities

1. In response to an invitation sent to the Philippines by the International Association for the Evaluation of Educational Achievement (IEA) to join the Second International Science Study, the University of the Philippines Science Education Center (UPSEC) in cooperation with the Ministry of Education, Culture and Sports is undertaking a science education study. The study jointly funded by the UPSEC and the National Science and Technology Authority (NSTA) has both international and national components. It proposes to examine elementary and secondary science education around the world and to identify factors which explain differences across countries. The national component, on the other hand, seeks to determine the present status of science education in the country through an assessment of student competencies in science and an identification of factors which explain differences in performance by regions and types of school. The results of the study therefore should be useful in improving science education in the country.

2. Through sampling design, 300 secondary schools and 500 elementary schools, public and private, will be selected to participate in the study. The target population includes one physics class, fourth year and one chemistry class, third year from each selected high school and one grade five class for each selected elementary school. For any given school, only one or two classes will be tested depending on the level. Details of the study are enclosed.

3. The UPSEC staff will be communicating/meeting with school officials concerned regarding their participation in the study.

4. In view of the significance of the study, the cooperation of all concerned is enjoined.

(SGD.) ONOFRE D. CORPUZ
Minister

Incl.:
As stated

Reference:
None

Allotment: ~~1-2-3-4-~~(D.O. 1-76)

To be indicated in the Perpetual Index under the following subjects:

OFFICIALS
RESEARCH or STUDIES
SCHOOLS
STUDENTS

(Inclosure to NECS Memorandum No. 81,s. 1983)

SECOND INTERNATIONAL SCIENCE STUDY: PHILIPPINES

In 1981 an invitation was sent to the Philippines by the International Association for the Evaluation of Educational Achievement (IEA) to join the Second International Science Study (SISS). The study is a cooperative research undertaken by a number of countries to examine elementary and secondary science education around the world and to identify factors which explain differences across countries. The Philippines accepted, not only because of the significance of the study but also because of the opportunity to interact with and learn from international researchers.

By way of background, a similar research was conducted in 1970 — called the First International Science Study (FISS for short). The second study is a follow-up on the first after a lapse of one decade, although there are several countries who have joined SISS but who were not involved in FISS. The Philippines is one of them.

While the overriding aim of SISS is international in scope, each participating country is conducting its own national study in order to thresh out issues/problems relevant to the country. The greater portion of the instruments consists of an international core of items by which the crossnational issues are studied; there are also national items added by each country, and therefore differing from country to country, which address the issues particular to the country.

The International Center for SISS is the Australian Center for Educational Research in Swthorn, Victoria, Australia. Each country has a National Center which works closely with the International Center. In the Philippines among its functions are: formulation of sampling and administration plans, supervision of the construction of the national items, overseeing of the collection of data, analysis of data, preparation of the final report of the national study. To ensure reliability and comparability of results, meetings have been held among key persons of the different National Centers. The first was held in Italy in 1981; the second in Japan in 1982. The second meeting was especially important since many decisions were made on the instruments, and instructions were given on the sampling design, administration plan and data analysis procedures.

Countries participating in SISS (as of November, 1982)

Australia	Hungary	Poland
Barbados	Israel	Romania
Belgium	Italy	Singapore
Botswana	Japan	Sri Lanka
Canada	Korea (Republic)	Swaziland
China	Mexico	Sweden
England	Netherlands	Tanzania
Finland	New Zealand	Thailand
Ghana	Nigeria	Trinidad and Tobago
Guyana	Papua New Guinea	United States
Hong Kong	Philippines	Zimbabwe

The Philippine Participation

The National Center for SISS study in the Philippines is the Science Education Center of the Philippines, Quezon City, with the Ministry of Education, Culture and Sports as a very involved cooperating agency. Some funding has been received from the National Science and Technology Authority.

A National Committee was created to provide advice and assistance for the conduct of the study and to represent different segments of the educational community. The members are:

Dr. Adoracion Ambrosio	Deputy Director, Science Promotion Institute, NSTA
Dr. Cleofe J. Decungan	Director, Philippine Science High School
Mrs. Lourdes Garlis	Biology Teacher
Dr. [illegible] Jimenez	Representative, Bureau of Secondary Education, MECS
Mr. Radamee Doctor	Vocational Instructor
Prof. Josefina C. Ponacler	Mathematics Educator
Dr. Jasmin A. Gavino	Educational Psychologist
Dr. Ana Javellana	Chemistry Professor
Dr. Cristina P. Parel	Statistician and Project Consultant
Mrs. Sonia Perfecto	Elementary Science Teacher
Mrs. Vicenta Reyes	Biology Teacher

Dr. Gloria Salandanan	Science Teacher Educator
Dr. Vivien M. Talisayon	Physics Educator
Miss Raquel Valle	Representative, Bureau of Elementary Education, MECS
Mrs. Lilia Vergara	Chemistry Teacher
Dr. Dolores F. Hernandez National Coordinator	Director, UPSSC

Together with the international aims of SISS, the national study has set the following as national aims:

1. To measure the current state of science education as determined by international and national achievement tests and attitude scales

   1.1 To compare the current state of science education among the 13 regions

   1.2 To determine a norm for science education in the Philippines in populations 1, 2, 3.

2. To identify factors which explain differences in the output of science education programs by regions, types of schools, economic characteristics, pupil characteristics, teacher characteristics, etc.

3. To ascertain whether or not students are educated sufficiently in science to meet scientific and technological manpower needs.

4. To promote continuing science education study in the Philippines as a basis for planning for development, innovations, reforms, etc.

The National Center, with the help of the National Committee has prepared a National Science Curriculum Case Study. This Case Study reported on the Philippine Educational system with special attention to the context, scope of the curriculum, teaching and learning strategies in science at the elementary, lower secondary and upper secondary levels, and major changes between the 1970's and 1980's.

The National Center also carried out an analysis of science curricula. This was done with the help of teachers of public and private schools at the population 1, 2, and 3 levels. Two dimensions of science curricula were rated: the content dimension and the process dimension. A list of areas under each dimension was drawn up by the International Center and sent to the National Centers for rating. Each item was rated as 3, 2, 1, or 0 in accordance with internationally accepted methodology to reflect both the level of emphasis in terms of subject matter and universality in terms of proportion of students studying the particular area.

Populations to be Tested

The following student populations are targetted for study:

Population 1: all students in regular elementary schools at grade 5 level (after 5 years of schooling)

Population 2: all students in regular high schools at third year level (after 9 years of schooling)

Population 3: all students in regular high schools at fourth year level (last year of schooling)

In terms of years of schooling, Philippine populations 1 and 2 are compatible with populations 1 and 2 of other countries; however, Philippine population 3 would have only 13 years of schooling while most (or all) other countries which have 12 or 13 years of schooling on the last year. It was decided therefore that data for population 3 shall be used only for the national study, not the international study.

The Sampling Design

For population 1 it was decided to consider 15 classes or strata: public schools from 13 regions, private schools from the NCR region, private schools from the provincial regions. Five hundred elementary schools shall be selected for the sample, with the number from each stratum being proportional to the total number in the region. One intact grade 5 class would be chosen from each school; so on the assumption of 30 pupils per class (average), this would involve around 15000 grade 5 pupils.

For populations 2 and 3, it was decided to divide the country into 39 strata: barangay and municipal (public) high schools from 13 regions, provincial, city and national (public) high schools from 13 regions, and private high schools from 13 regions. Three hundred high schools shall be selected; again the number from each stratum would be proportional to the total number in the stratum. Choosing one intact second year class and assuming an average of 40 students per class, then 12000 third year students would be tested. Likewise, 12000 fourth year students would be tested.

The MECS Statistical Bulletin 1981 gives the information that there are 5156 high schools and 31455 elementary schools in the country. A list of the names and addresses of as many of these schools as possible is being made, to constitute the sampling frame. As of February, 1983 the list contains 4117 high schools and 20850 elementary schools.

The Test Instruments

While the intended curriculum is reflected by the curriculum ratings mentioned earlier, the achieved curriculum is reflected by student performance on achievement tests.

The achievement tests in pretesting form were prepared at the International Center. However, they were sent to the National Centers for reaction; furthermore, they were trial-tested in these countries to obtain national indices of facility and discrimination and information on language and testing time. The reactions from the National Centers and the results of the trial-testing, together with the curriculum ratings, were all considered in the revision of the items.

For the trial-testing we are indebted to the following schools:

Bay Elementary School, Laguna
Bulacan College of Arts & Trades, Bulacan
Cainta Catholic School, Rizal
Cainta Municipal High School, Rizal
Canossa Colleges, Laguna
Central Philippine University, Iloilo City
Cecilio Apostol Elementary School, MM*
Culiat High School, MM
Dalahican Elementary School, Quezon
Los Baños Barangay High School, Laguna
Malabon Elementary School, MM

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* MM: Metro Manila

Malabon Municipal High School, MM
Malolos Central School, Bulacan
Marikina Institute of Science and Technology, MM
Masaya Barangay High School, Laguna
M. H. del Pilar High School, Bulacan
Parañaque Elementary School, MM
Parañaque High School, MM
Quezon City Science High School, MM
Quezon Provincial High School, Bulacan
Quirino Elementary School, MM
Rizal Technological Colleges, MM
Sacred Heart Colleges, Laguna
San Agustin University, Iloilo City
San Crisvobal Barangay High School, Laguna
San Miguel Elementary School, Laguna
San Pablo Central School, Laguna
San Pablo City National School of Arts & Trades, Laguna
St. Louis University, Baguio City
St. Mary's Academy, MM
St. Scholastica's College, MM
Tanza Elementary School, Cavite
Tanza National Comprehensive High School, Cavite
Tanza National Trade School, Cavite
University of Sto. Tomas, MM
University of the Philippines Diliman
UP College Baguio, Baguio City
West Visayas State College, Iloilo City

In addition to the cognitive tests other instruments will also be used; among them: word knowledge tests, quantitative ability tests, attitude scales. There will also be instruments to elicit background information about students, schools and teachers.

As mentioned earlier, all these instruments have an international core so that cross-country studies can be made; additional there are national items specifically for in-country studies.

It is hoped that the study will provide information of value to decision-makers at various levels — e.g., in matters of policy, or curriculum, of teaching; and guidlines to professional organizations for effecting solutions to problems in science education in the country.

Tentative Time Table

Stage 1	Planning	
1983	March-September	Finalization, printing of instruments Finalization of plans for data analysis Preparation of national codebook
	March- May	Selection of sample schools
	June	Orientation meetings with MECS Directors, Superintendents, etc.
	July-October	Briefing meetings with MECS Supervisors, Test Coordinators, etc.
	October-December	Distribution of instruments
Stage 2	Data Gathering	
1984	January-February	Testing
Stage 3	Data Processing	
1984	March-October	Processing of data Interpretation of results
	December	Submission of school reports Submission of data to International Center
Stage 4	Preparation of Reports	
1985-1986		