philippine studies

Ateneo de Manila University • Loyola Heights, Quezon City • 1108 Philippines

Basic Reforms in Science

James A. McKeough

Philippine Studies vol. 10, no. 3 (1962): 472—474

Notes & Comment

Basic Reforms in Science

About five years ago the American school-reform movement began on the high school level under the catalyzing influence of Dr. James P. Conant. Many of these basic reforms pertain to the teaching of science—mathematics, physics, chemistry, and biology. Under National Science Foundation grants many high-school teachers attended summer institutes, year-long institutes, and in-service institutes to study new programs for the teaching of science. As a result the School Mathematics Study Group course has been introduced into some freshman and sophomore classes. The physics program of the Physical Science Study Committee is now being used in some schools for both junior and senior honor classes. Other schools are experimenting with pilot study programs in chemistry such as the chemical educational material or the chemical bond approach. All of these science programs are part of an effort to raise the level of high school science teaching by up-dating and improving the course content and laboratory procedures.

In recent years it has become evident to many American educators that if these high-school reforms were to be effective they would have to affect education all the way down the line to the level of elementary and intermediate school training. For example, the Reading Reform Foundation advocates greater stress on phonetic or letter- and syllable-conscious methods of reading rather than the traditional whole-word recognition method. The new approach to mathematics from kindergarten through third grade lays greater stress on "sets" of things, such as a bunch of sticks or pencils, rather than on numerals. The teaching of General Science has also been upgraded by various study groups and with many new teaching materials—attractive texts, worksheets, films, slides and other aids.

Here in the Philippines a similar reform movement has begun to re-train high-school science teachers. There have been summer

institutes organized by the Philippine Normal College, the University of the Philippines, the Ateneo de Manila, and just recently by the Ateneo de Davao and San Carlos University. The Ateneo programs were made possible by the cooperation and support of the National Science Development Board and the Asia Foundation, as well as by the initiative and encouragement of Jesuit scientists. Their program is well organized and it affords a competitive opportunity for high-school teachers in public and private schools in all parts of the Philippines to make an intensive six-week study of modern science and the new approaches to its teaching. The Department of Chemistry of the Ateneo de Manila has just published a trial text based on the chemical bond approach to introductory chemistry which will be used for the first time in Jesuit high-school departments and in other schools during the academic year 1962-1963.

As far as I can judge, many of the science reforms, both here and abroad, have one common tendency—to insert more and more college science matter, both in quantity and quality, into the high-school curriculum. This is almost inevitable since reform movements are from above, that is, from college and university professors who are in the process of upgrading the high-school science program and of coordinating it with the college curriculum. A similar situation exists when graduate school research slips into college textbooks, or when high-school science courses are found in the general science manuals of the intermediate grades. Thus the new progressive system of science education seems to be an attempt to upgrade by down-pushing the matter from college to high school, and from high school to intermediate grades.

This approach to science reform will lead some to say that it is simply a cruel speed-up, while others will charge that it is a return to the laissez-faire of progressive education. However, the reform can be defended by saying that it aims at not letting the pace be slowed down by low estimates of the power of young minds to understand basic scientific principles, theories, and methods. By a process of adaptation consisting of a simplified terminology and familiar illustrations, science courses can be made interesting and intelligible to young minds.

Some principals and teachers are very frank in admitting difficulties in introducing new types of science courses into the high-school curriculum, especially if they encounter problems in adapting a rather advanced text to students of average intelligence. Perhaps some of the new programs are geared more for the few than for the many, that is, for students with a high I.Q. or for those in a science honors course. The success achieved by such programs can only be measured by pilot studies in each school. Only then can we observe whether we are justified in extending the new course throughout all

classes, or whether we should limit it to those in a science honors course. Our final judgment will be an evaluation made on the basis of experience.

Other principals are not too eager to endorse any new science programs because of financial difficulties. They foresee a new and costly layout for textbooks, manuals and equipment. If a new course is meant only for a few and not for the many, then we prefer, they say, to keep the courses the way they are and to conduct our laboratory periods along the traditional lines. Besides, one or two of our teachers may study in a summer institute and then in a year or two they will leave our schools to seek employment in another. So why bother?

There is no doubt that these are real difficulties in attempting to introduce what is new, but they are not insurmountable. I have had an opportunity to talk with some of the high-school teachers who received special training in the Ateneo de Manila Summer Institute in 1961. They were enthusiastic about the new approaches to the teaching of modern science, and they were eager to share that knowledge with other science teachers on the faculty. At our third Annual Science Fair these teachers united to exhibit the simple inexpensive pieces of equipment that are needed for the new course in the chemical bond approach to introductory chemistry. They also exhibited some of the laboratory equipment made from local materials with the aid of our own shop tools.

A fellow scientist has well said that "it is these very teachers that constitute our greatest asset. Their zeal and devotion has been a constant source of inspiration to those who have studied this problem at length. If the opportunities are provided for these devoted teachers to work together on common problems, to become acquainted with new methods and recent developments, to grow in professional competence, if they are given the help they need to help themselves, science education in the Philippines can hope for great things in the future."

Unfortunately I have heard some college science professors severely censure high-school teachers because of the inadequate training they have imparted to their students. Such professors sometimes assume that the incoming freshmen know little or nothing about mathematics or physics. Or they assume that whatever the students did learn is either all mixed up or long since forgotten. There may be more than an ounce of truth in some of these statements but I would be very hesitant in criticizing high-school science teachers in this matter. Most of them are teaching a full load of subjects and also they are often enough engaged in one or more extra-curricular activities. One teacher told me that she was as-

signed to perform the laboratory experiments in General Biology in the school grandstand! With a lack of laboratory space, equipment, books, and with a lack of a scientific atmosphere in general, it is a wonder that high-school teachers can do as well as they do in science. In spite of all these handicaps these teachers are willing and eager to learn more about science, and to carry on the best they can under the circumstances.

It is only by a spirit of sympathy, understanding, and cooperation between college and high-school science teachers that science education in the Philippines will improve. This spirit must not only be the keynote of summer institutes but also must motivate colleges and high schools in a given area, and college and high-school departments in the same school. Only by this cooperation can we make the essential basic reforms in science education.

JAMES A. MCKEOUGH

The Teaching of English in Cultural Context

A new kind of English course was offered during the 1962 summer session of the Ateneo de Manila Graduate School. Listed as "Teaching English as a Second Language," it was directed by Father John W. McCarron, S.J., and Dr. Emy Pascasio, both of the Ateneo's Department of Language and Linguistics. The daily schedule included three hours of intensive language-in-context study and an additional hour devoted to a comparison of the American and Philippine cultures.

The basic premise of the course is that learning a new language involves more than learning a new grammar. Besides new sounds, new words with their own proper meanings, and new syntax, a whole new set of social relationships and value attitudes must be learned if the student is to use the language as it is used by its native speakers.

For a language is more than a way of making one's basic needs understood. It is the expression of an art, a literature, a set of values; in sum, it reflects the culture of a people. Each society has its own way of viewing its natural and social environment, and of coming to terms with it. Thus the spatial and social distance to be maintained between two people in conversation will vary greatly from country to country. In some cultures talking with an individual of lower or higher status demands a special manner of speech. Timing is important, too. One comes to the point more quickly in English than in Tagalog, and the speaker of American English need not say "May I ask a question?" before he asks it, even of a stranger.