

17 Chemistry in Filipino

CHEMISTRY is the science concerned with the totality of things in our environment, the changes that occur in these things, and the energy involved in these changes. Knowledge of chemistry is important for understanding the truths about our world, for creating materials to improve our lives, and for solving some of the problems in our environment.

Chemistry is taught at the third-year level in high school. In university, chemistry is one of the sciences taught in Natural Sciences, one of the subjects required for all students. The study of Chemistry is deeper for students specializing in Science.

Currently, English is used in teaching chemistry and other science subjects. Can Filipino be used in teaching it? Is there a need to use Filipino? I will answer these questions based on my experience teaching chemistry—whether elementary or advanced.

The Need

Many teachers take pride in using Filipino when their students do not understand an explanation in the English language. These teachers are silent when asked why they still need to wait for the occasion when their students do not understand before using Filipino in their teaching.

Most students struggle with using and understanding the English language. This is a fact proven by several research studies. Students understand lectures in Filipino more easily than in English. Even if a teacher is very good at teaching in the English language, they are not immediately understood by most of their students.

Many teachers in public schools, especially those in the provinces, use or are forced to use Filipino in their lectures because they see that students understand better in their own language. They know that what they are doing goes against the DECS directive on bilingualism, but because of their desire for their students to learn, they do not follow this directive.

In my university, and perhaps in most other schools, colleges, and universities, the administration encourages the use of English in teaching so that students will be "globally competitive." They advise teachers to be fluent in English and to teach in English. In our meetings at the College of Science, I often remind them that we need to accept the reality that not all students are good at English, and a teacher's skill in explaining in English is useless if they are not understood by those they are teaching.

In my teaching, I see that students can follow more easily if the lecture is conducted in Filipino. They are more free in their questioning and our discussion is more alive. I have no statistical figures to provide to prove that teaching chemistry in Filipino is more effective. However, there are some research studies conducted in other universities that showed no difference in the effectiveness of teaching in English or Filipino. For me, the active participation of students in class discussions is important. Their learning is more based on their intellectual capacity.

I believe that if teaching chemistry and other sciences in Filipino becomes widespread, the formation of a scientific culture in our country will accelerate, and the country's benefit from science and technology will grow. Conversations about science will be easily understood by the public and not just by academics and students.

The Chemical Society of the Philippines is divided regarding the Filipinization of chemistry teaching. One side is concerned that students' proficiency in English will weaken and the advantage of Filipino scientists in international gatherings will be lost.

We remind those who object that the advanced countries in the field of science are Japan, China, Germany, and Korea, all of which are not proficient in the English language. We also emphasize, in agreement with teaching chemistry in Filipino, that English does not need to be lost if Filipino is used in scientific discourse.

Chemistry Words

The hesitation in using Filipino in teaching chemistry concerns scientific terms. There are only a few words in our language for things related to chemistry or science.

There are some experts who have endeavored to create scientific words in Filipino and compile a Filipino dictionary for science. Leading them was the Committee on Science led by Gonsalo del Rosario of Araneta University Foundation, which began creating science words in 1977. Jose Sytangco of the University of Santo Tomas also recorded Filipino medical terms in 1977. In 1988, the husband-and-wife team Bienvenido and Salome Miranda of the University of the Philippines formed a vocabulary for chemistry.

As the language is used, the words included in the language increase. For example, currently there are several words equivalent to *Chemistry* in English: (1) **KAPNAYAN**, forged from the words *sangkap* (composition) and *hanayan* (ordered arrangement of science), (2) **KIMIKA**, which came from *quimica*, the Spanish word for Chemistry, (3) **KEMI**, derived from *Chemie*, the German word for Chemistry, and (4) **KEMISTRI**, which is the English word spelled in Filipino. In my opinion, all of these are correct Filipino words. Currently, each has their own choice of the word they want to use. Over time, the best word will remain and it will become the Filipino equivalent of *Chemistry* in English.

Sometimes translating some words from English seems easy, but upon first use, it is funny and awkward to use. For example, in my lecture about the properties of light, my translation for *wavelength* was **HABA NG ALON**. Many smirked because they were not used to hearing it. I explained that the literal translation is justified because it gives the correct concept, similar to Spanish where the equivalent of this word is *longitud de onda*, also a literal translation. This is also the case in German where the word used is *Welllange*. Some of the other translations I made were **DALAS NG ALON** for *frequency*, **BILIS NG ALON** for *wave velocity*, and **TAAS NG ALON** for *wave amplitude*.

Literal translation from English is not always correct, because the meaning of a word or term can be different. For example, according to Professor Miranda, the word for *test tube*, a common laboratory equipment, is **SUBUKANG TUBO**. For the English word *solid*, a simple and important concept in chemistry, Professor Miranda's translation for this name is **BUO**, and Dr. Sytangco's translation is **SIKSIK**. In cases like this, I use the word based on Spanish or English—hence *solido*.

Many of my chemist colleagues agree with the creation of English terms spelled in Filipino if there is no proper equivalent word in Filipino. Because of this, they accept the words **ATOM** or **ATOMO** (and not *MULAPIK*), **ELEKTRON** (and not *DAGSIK* or *KILAB*), **MOLEKYUL** or **MOLEKULA** (and not *MULATIL*). Terms for new or advanced technology are derived from English and spelled in Filipino, such as **SEMIKONDAKTOR**, **KOMPYUTER**, **POLIMER**, and **FAYBER**.

The Training of Teachers

Currently, if you ask chemistry teachers if they want to teach in Filipino, their answer is no. They will reason that they will have difficulty because they are not used to explaining technical concepts in our own language. Most use "Taglish," mixing English and Filipino in one sentence. In our department, I criticize those who teach in Taglish, and I advise them to avoid it and try to form correct sentences in either English or Filipino.

In our Research Center for the Natural Sciences, we hold a "Science Seminar" every year. Some of our researchers are requested or assigned to give a lecture about what they are studying. The topics are usually advanced lessons such as semiconductors, spectroscopy, the chemistry of medicinal plants, fiber optics, and recombinant DNA. The speakers strive hard to conduct their discourse in the Filipino language instead of Taglish. I told them that this needs to be worked on and the reward for this is gaining confidence in giving a lecture in our own language.

They write their lectures, and it is reviewed by a teacher from the Department of Languages. The audience consists of students specializing in science who do not yet know anything about the topic to be raised in the lecture. The lecture is always lively and the students are awake. Life is vibrant and the discussion is free, and the audience is pleased. After the lecture, the speaker is also very happy that they made it through. They proved to themselves that they can give a lecture in Filipino. They bring that confidence to their class and strive to teach chemistry in Filipino.

It is easy to give a lecture in our own language. It is easy to speak, but it is not as effortless to write a technical paper. Great practice and training are needed for this, especially for the current generation of teachers who learned their knowledge in the English language. Many say that they think in the English language for technical discussions, and their writing is a translation from the English that is in their minds. In my experience writing in Filipino using a typewriter or

computer, I need to train my left pinky finger well—the letter "a" is frequently used. (Perhaps a special keyboard is needed if Filipino is used for typing, like in Germany where they changed the position of the letters "y" and "z.")

Again, in our Research Center, this year many of our researchers are ready to accept my challenge to write their research posters in Filipino. We have a Congress of Technical Posters held every two years. Research in advanced science conducted by our professors is shown and explained in posters. In fact, the poster shown by our Center during the past Science and Technology Week was written in Filipino.

I see that with gradual practice in writing about technical topics, the time will come when our teachers will be able to write a booklet or book in Filipino about science and technology. There is only one or a few chemistry books written in Filipino. This is the book *Koleyds Kemistri* by Salustiano Tengociang of the University of the Philippines. Many criticized that many words in this book are just English words spelled in Filipino.