Proceedings

The Problems of Science Education in Malta - A Brief Overview

Charles Mizzi
Director (Curriculum Management) - Education Division, Floriana.

I believe that the problems of Science teaching in Maltese Schools are the fallout of two main factors, namely, the relatively recent historical development of the introduction of a science component in the core curriculum, and, the byzantine divisions among "science" teachers who through their personal background and training, owe "allegiance" to one branch of science rather than to a holistic heritage of scientific knowledge.

I propose to give, in this article, a brief commentary on these two facets. As it contains personal interpretations, I do not mind being judged by the reader as having been "subjective", for that is exactly what I am going to be. I would be more than happy if the article gives rise to an exchange of views with interested parties whose perception might be different.

The introduction of Science in the Maltese curriculum
When I entered the Lyceum in 1954, I was exposed to two lessons of "Science" per week in the first two years of my secondary education. *(Needless to say, Science had no place in the Primary curriculum).* The syllabus in Form I was made up of a skimpy overview of flora and fauna. The syllabus covered in Form II ensured that during the first term, we covered the features of the Bunsen burner - "a very efficient burner" which we never saw.

In Form III, I happened to choose Physics as an optional subject. *(Most students would bypass the study of science thereafter. Their knowledge of carnivores, herbivores, omnivores and Bunsen burners being deemed as a sufficient scientific preparation for life).* The Form III textbook was a skimpy one covering solely "Heat Energy." The Form IV syllabus covered rudiments of Optics. In Form V, the rest of the GCE Physics Syllabus was supposed to be covered in six months. No wonder so many students detested Science, particularly Physics! No wonder so many failed to pass their GCE in Physics!

One interesting evaluation of the situation prevailing at the time, that I came across from a third party, was that "syllabi at the time were of the right length so as to be adequately covered in private lessons during the summer months when Lyceum students had to sit for their supplementary examinations, once they had failed their annuals."

The reason for making such a song and dance about the situation at the time, is that we may easily forget that many who have occupied command positions in the intervening years, had an inbuilt perception of the validity of science education founded upon their interpretation of their formative years at school. Thus, as an example, one should not underestimate the influence that say a female head of school who had received her education pre-1955 and has an inbuilt conviction that she has got by very comfortably without any science education, might have had on her students and their perception.

In 1958, things started to change. Science education became a serious proposition and pursuit. Females were offered the opportunity to take up science as an option. Science was no longer regarded as being fit solely for males. GCE Ordinary Level syllabi were updated and were no longer risible. A sixth form course in the sciences based at the freshly opened secondary technical school at Corradino was launched, leading to the (then) recently set up GCE Advanced Level examinations. Yet, science education was the province of only a small minority of the student population - the "cranky ones" of whom I was one. From being one out of an original six, I have seen the numbers building up bit by bit, until years later, a critical mass of science educators scotched the perception of a science education being solely fit as an option for a few freakish kids.

In 1976, a new development took place. A top-down edict established Physics as a core subject of the secondary curriculum. The innovation was not, to put it mildly, introduced in the most felicitous of manners. Its introduction as a core component was concurrent with the introduction of Arabic. The two subjects displaced the teaching of one foreign language, geography and history from the core curriculum. It was thus perceived as a threat to a group of teachers with allegiance to these subjects within the schools. Antipathy to the "impositions" was rife and made rational judgement of the situation rather difficult. The measure became controversial with political overtones in a polarised situation.

The two questions which were asked at the time were "Why should Science be a compulsory subject on the curriculum and not remain an option for those who are willing to take the plunge?" and "If there has to be a compulsory science component in the curriculum, why on earth should that component be exclusively Physics?"

It is interesting to note that twenty years on, the first question has receded into oblivion. Maltese society has accepted that an all round Secondary education necessitates meaningful exposure to science in the formative years. It is also worth noting that in the past twenty years, the administration of the Island has changed hands twice. Arabic has been dropped, but, curiously, Physics has survived.

For the record, I wish to report the authorities' point of view regarding the issue of Physics as a compulsory subject, at the time of its introduction. Physics was then perceived as a vocational subject - a subject which would entice students into the fields of engineering and medicine. An engineering career required a good foundation in Physics and Mathematics. A medical career required a good foundation in Physics, Biology and Chemistry. In line with the philosophy at the time that career choice should be left to as late a stage as possible, Physics was perceived as the common factor between the two careers. Compulsory Physics would entice students to science oriented careers, leaving the choice between engineering and medicine until the age of sixteen. This perception may now have been superseded with the introduction of the Matriculation examination. On the other hand, considering the special requirements of the various Faculties, it may not have been superseded at all.

Perception is changing from a position of science being a "vocational subject" to science being an integral part of a general culture and education.

It may be the case that the time is ripe to address the following three issues:
(i) Is Physics being taught in Maltese secondary schools in a vibrant enough manner?
(ii) Should the exposure to a science education be broader than the constraints of an exclusive Physics syllabus would allow?
(iii) Should a meaningful exposure to science start at Primary school?

The fragmentation of Science in three distinct fields

Is there any such thing as "a teacher of SCIENCE", in contrast with a teacher of Physics, a teacher of Chemistry or a teacher of Biology? If we were to address the issues raised in the last paragraph of the previous section, would the "teacher of combined science" find difficulty in changing from being a teacher of a branch of science? The question certainly begs investigation.

Irrespective of what might have been surmised from the reading of the article this far, the author (as a teacher) was not a science teacher. He was a teacher of Mathematics. In that discipline, it never occurred to him that he should teach Arithmetic exclusively ..... or Algebra exclusively ..... or Geometry exclusively. Neither did it occur to anybody that an integrated syllabus in Mathematics was a softer option than say a syllabus in one of the branches of Mathematics.

Such does not seem to be the case in the science field. There is a general perception that "Science" or "Integrated Science" is far easier than "Physics", "Chemistry" or "Biology"? Why is it that a subset is seen as easier than the whole?

I do feel that these are a few issues that have to be resolved before we decide on which course to adopt in the future. Obviously, there are many other issues to be considered, which I have not touched upon here as I know that other contributors are dwelling upon them in their contributions to this forum.

At present, the Ministry of Education is undertaking a review of the National Minimum Curriculum (3 to 16 year olds), which exercise it has delegated to the Department of Curriculum Development of which I am the Director. The exercise is going to be based on widespread consultation and will last up to March 1998 - to enable initial implementation of the new curriculum to take place in September 1998. It is the apposite time for stakeholders in Education to participate in this general and radical rethink by proffering their contribution and participation.