

Science and Technology - School Education

under the restructuring scheme for the new millennium

The restructuring of curriculum related to Sri Lanka's school education took place in the latter half of 90th decade. In 1998 this restructuring of Primary Curriculum started in a limited scale in Gampaha District and from 1999 this was scaled up to cover the entire island. By 2003 this restructuring of primary level had reached the last grade, i.e. grade five. The restructuring of curriculum school education levels of grade 6 and 9 was started in 1999 and it was put into action three years till 2001. The advance level curriculum was renewed in 1998 reducing the number of subjects to three.

By completing the eight year curriculum cycle, the restructuring of curriculum, it is supposed to be introduced from 2007. The restructuring of curriculum in the new millennium mainly paid attention to 6 to 9 grades which includes the junior secondary grade, and grades 10 and 11 which include the G.C.E. (O.L.). Out of them, restructuring of 6th and 9th grade curriculum has been started in 2007.

The new curriculum of junior secondary levels has been made common to grade 6, 7, 8 and 9. The restructuring of 90th decade, the subjects of grade 6 which were kept as a transitional period, have been changed under this common curriculum. In the primary level students were introduced to the curriculum by a single teacher, in the grade 6 they will be introduced to a number of subjects taught by different teachers. Students of this young age when taken away from a compounded curriculum and introduced to a single subject curriculum may face new challenges. To minimize such effects, especially considering grade 6, two compound subjects were included into the new curriculum. Out of them, the first is science and social science subjects as well as technology included in the environmental studies subject. The second is, the common fine arts subject which included the drawing, dancing music, drama and acting.



Even though, thus steps being taken to introduce the unitary nature of curriculum to grade 6, some observed that this has resulted in undesirable results. When they analyse the

restructuring done in 90th decade, they have shown that the prominence given earlier to science subjects have been down graded. The reason for this down grading is that last G.C.E. (A.L.) curriculum restructuring, to introduce new subjects Biology and Combined Maths by combining 4 different subjects.

Also, they argue that for the grades 7 to 11, instead of science subjects, Science and Technology subject has been introduced. This has resulted in not giving enough time for students to develop their scientific concepts, technology in science in application and

usage. The curriculum makers have tried to introduce the relevant technical sections within the science itself and thereby have weakened to certain extent the scientific concepts. Even though, the subject environmental studies in grade 6 has been introduced with good intentions, many critics say that students have failed to understand scientific concepts

Technology is another subject that is very closely related to science. After the independence of the country, although arts, science and commerce have been favourite subjects at different period, the future of the country depends on technology. The school children first recognize technology at the grade 6 level as they start learning Practical and Technical skills. This subject runs throughout the junior secondary level relevant to grades 6, 7, 8, and 9. At first, students gain the background experience by learning this subject at junior level by doing activities related to environment.

and, to look at them scientifically. The theme "Water" is taken as an example. Under the environmental studies subject, even though it has been considered in detail the subject has failed to surface the scientific principles connected to water correctly.

Under the restructuring scheme of primary education in 1990's decade, it may appear that the place given to science has some what weakened. Instead of starting the introductory science subjects from grade 3, today they start from grade 1. What is included is the activities related to environmental activities. The environmental activities introduced to study the scientific concepts with sufficient opportunities, is a subject that takes an important place in the primary school curriculum. When this subject was structured apart from science, social science, aesthetic subjects, physical education, hygiene, nutrition as well as creative activities and spoken English have been added. Under such a subject does one get sufficient attention to build up basic concepts of science? Is it possible to build up the foundation needed for higher grades to study science? Such logical questions have been raised. The primary problem that others pointing out is that a considerable number of teachers are incapable of correctly surface the scientific concepts commonly forwarded by the above subjects.

By considering the aforesaid reasons, the governmental authorities have decided to carry forward the science for everyone with a much sound foundation. Instead of previously proposed subjects for G.C.E. (O.L.) i.e. general science, physics, chemistry and biology the authorities have decided to re-introduce science for all from grade 6 to grade 11.

Yet one should understand that there are marked differences in the subjects introduced under G.C.E. (O.L.). No longer the teaching of science subject for G.C.E. (O.L.) remains as a compound subject, it has been proposed to change the science subject teaching as units divided according to number of forms. For example in the grade 10, first term has been set aside for teaching Biology, second term for Chemistry and third term for Physics. According to this plan equal attention has been paid to three basic subjects included in the science. By studying the above three subjects a student would be able to pass G.C.E. (O.L.) with sufficient science skills.

To day when one looks at the students who pass G.C.E. (O.L.), many of their capabilities have been limited to certain subject areas in biology only. This is no secret. By these results it is not difficult to recognize that there is a vicious circle i.e. there is a dearth of teachers who could correctly teach Physics and Chemistry subjects in schools. Physics and Chemistry (G.C.E. A/L) is also the basis for studying

Agriculture and Technology subjects. Therefore, it is necessary to avoid students learning parts of subjects, and to direct them to pay equal attention to learn all three basic science subjects equally. Therefore, discussions have been launched between Department of Examinations and the Institute of National Higher Education to change the conditions laid for G.C.E. (O.L.) science subject.

Under the new restructuring scheme special place has been given to Mathematics, a subject that helps to develop school children's logical thinking ability in various ways. In the junior secondary level equal to science subjects, five periods per week have been allocated for mathematics. In the G.C.E. (O.L.) six periods per week have been allocated for mathematics. Yet extra time may be needed to establish proposed mathematical concepts. It will be possible for school principals to allocate extra period for this according to their wish, from the free time set aside for them. For the junior secondary level this extra time is two periods, while it is four periods per week for G.C.E. (O.L.).

Hygiene and Physical education have a lot of scientific concepts and have relationship to science education. At the junior secondary level two periods per week are allotted to these compulsory subjects, while under the curriculum restructuring scheme at G.C.E. (O.L.) three period have been allotted as alternative subject. Although at the G.C.E. (O.L.) it is required to consider these subjects as a base subject, the Department of Education has decided to keep them as an alternative subjects, to prevent the increase of number of subjects unmanageable manner at G.C.E. (O.L.).

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The Practical and Technical skills subject which was introduced in 1990s under curriculum restructuring scheme, the National Institute of Education has decided to activate it under new face. Accordingly, the subject Practical and Technical Skills which is supposed to introduce to grade 6 in 2007, consists of five streams. These five streams are Agriculture, Food, Introductory Technology, Creativity and Entrepreneur Activity. Here it has been expected to direct the students more fruitfully to use creativity to use information and Technology Activities. It is expected to communicate these concepts correctly to direct students

in entrepreneur activity at an entrepreneur angle. For the first time in the year 2000 Practical and Technological Skills were introduced as an alternative subject which included development of vision, creativity and concert. Today these areas are limited to fine Arts subjects.

In the school education up to grade 13, economics, basic technology, agriculture, entrepreneur studies also get their foundation under practical and technical skills. Under Home Economic Science subject, certain parts of Food Technology have been added to make it more attractive for boys. This subject also stimulates student to take to catering service to supply food for various functions, various home based products and to enter Hotel schools.

There are two subjects included under the basic technology subject for G.C.E. (O.L.). These two subjects have been selected by combining a number of subjects. Under Design and Technology, subject has been added such areas as Mechanical Technology parts, building Technology parts and Electronic and Electrical parts. For the second subjects Arts and Crafts has included such areas as Pottery, Weaving, Painting, and Ornamental creating. Thus, under G.C.E. (O.L.) Technology combining of subjects have been done to make it easy for students to select a suitable subject as they like to specialize it.

To the G.C.E. (O.L.), two subjects combinations have been added namely Agriculture and Food Technology, and Fisheries and Food Technology. Six Agriculture subjects that were included earlier have been condensed into two subjects. This was done to create a foundation for "Technology", a new subject introduced to G.C.E. (A.L.) in 2005. The section of Food Technology is common to both subjects that have been newly added to curriculum. Sections in gardening and animal husbandry have been included into Agriculture Technology, while Ocean and land water sources related Bio Resources Technology has been included into Technology.

In the new G.C.E. (O.L.) curriculum, a large number of changes have been done about the commercial subjects. The "Entrepreneurial studies" has been introduced as a new subject. Today young people who complete their school education have not sufficiently developed their entrepreneurial skills, according to a survey carried out by International Labour organization (ILO). An entrepreneur

has a good understanding about himself and always prepared to take risks. S/he also has a clear understanding of his abilities and weaknesses. At the same time s/he must be able to understand the society and the social behaviour. S/he is also capable of generating new enterprise opportunities when required. This subject has been introduced with the intention of aiming to prepare young people with self reliance capability to take them to self employment.

It is very essential for entrepreneur to pay sufficient attention and to take correct decisions. One should understand this is like a gamble. Too much attention leads to deterioration, and not paying sufficient attention also leads for deterioration. We should understand that both will

obstruct one's development in the earlier curriculum that had been included as the basic principles of Entrepreneurship. Accounting has also been included in the new subject, so that they will be able to carry out simple accounting and to plan their enterprises. Also this subject has aimed at both profit making and non-profit making enterprises.

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Now we see how the practical and technical subjects that have been in the grade 6-9 get intergraded into G.C.E. (O.L.) curriculum. This practical and technical ability will also a helping hand for the students to enter into information technology field. At the primary level it is hoped to direct basic mathematics, and at the junior secondary level it will go ahead through practical and technical ability subject. All practicals included in the subject will help the students to get used to Information Technology field of study.

For G.C.E. (O.L.), the Information Technology was introduced for the first time in 2006. Under technical category scheme, this subject is being rearranged in 2007 to

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