

## STEM Education through the Finland Experience

B.W.G. Dilhani



Finland occupies a prominent place amongst the countries in which the best educational methods are practiced. Their system of education is very unique because the teachers are well trained and the children receive equal opportunities for education. Also the schools in Finland are allowed the freedom to prepare and adapt the subject content (curricula) that suit the particular school while keeping within the national curriculum. Adapting the curriculum to suit the region and the school is carried out with the participation of the school teachers, parents and the students. The Finland school curriculum

which has been prepared with the objective of producing citizens suitable for the nation, has identified the investigational approach as an essential component of education. Eventhough no specific reference has been made to STEM, it can be identified as a part of the Finland school curriculum. Another specific feature of the Finland education system is that they believe the children who received primary education, by who carrying out activities freely received a better education (learnt better) than those who learnt using books. Their concepts were :-

- The less hours of instruction will permit more hours for rest and for

more favorable breaks.

- Less testing means more learning.
- Less topics in the curricula means more indepth learning.
- Less homework means more free time.
- Less students in a class room means more care and individual attention.

In Finland primary school children do not have to face tests. They do not have to cover an extensive curriculum. They do not have homework. They do not get assignments from their teachers which they have to do at home, and take back to school the next day. Therefore children play freely, indulge in various activities and enrich their lives with varied



Fig 01 & Fig 02 : Equipment for children to play with Aeroplanes



**Fig 03 : The ship that can be floated in water**

experiences. The school play ground has been organized in such a manner that it is conducive to provide varied experiences to the children. Similarly the school corridors have been organized to provide various suitable learning opportunities. Unlike in Sri Lanka, the schools in Finland use technology to the maximum for the learning process. The children in the primary classes also use mobile phones, laptops, tab computers etc. for the learning processes. Equipment for sports and various activities for the students have been

children done with the assistance of the teachers. The students had a workroom to turnout these creations. Their work room had various modern equipment. Because it is dangerous for students to operate certain types of equipment by themselves the teachers assist them. An aeroplane and a ship which could be floated in water, and turned out of wood, were among some creations the primary school students had turned out. When they are making these creations, the plan for the creation is also thoughtout by the student itself. They get an opportunity to make their creation a success after carrying out a few trials.



**Fig 04 : The workroom for the students**

placed in different locations within the school building itself. These activities are related to STEM activities.

It was observed that there were various creations of the primary school

The teachers will assist them only when required. When planning the creations the students will have to use their knowledge of all subjects such as science, mathematics technology and engineering. They have also used their aesthetic talents or skills to make their creations aesthetically attractive or appealing. Although making these creations provide a very good opportunity





**Fig 05 : The proposed location for the students to suitably organize their assignment**

to employ STEM, the term STEM is never used by them to describe these activities. What is expected through these activities is to help the students to be able to face challenges, to improve their creativity, to find solutions to problems, to engage in teamwork with patience, and to strengthen their ability to face difficult situations, thereby facilitating them to become balanced individuals with a fine personality. This is how STEM is employed in the education method of Finland.

Opportunities have been provided to students to gain STEM experiences through various activities organized by the school outside the curricula. As an example when changes have to be made in the school premises/

environment, ideas and suggestions from students are encouraged, and the students are assigned the responsibilities associated with the suggestions they have made. The principal would organize a suitable small location out doors in the school for the students to leisurely spend the time during the autumn. He would also supply some wood furniture for this purpose. His idea is to assign this activity to the students to plan and organize this location to suit the purpose. Through this type of activity too the students get an opportunity to incorporate the various subject curricula they have learnt and to test

it out. When a child gets such opportunities to actually use the knowledge they have gained, it is very fruitful to their learning process. Through this process the students get the opportunity to gain a better understanding and knowledge than what they would gain using books alone or answering examination papers. In Finland it is possible for the teachers to engage the children in these activities, and students very willingly carryout these activities because the curricula are not extensive and not a burden.

Eventhough during primary education more emphasis has been placed on such activities, in the higher grades, there is more emphasis on projects, investigations and experimentation. These have been planned and introduced so as to engage the students in these activities collectively as well as individually. Forty seven percent of the students who have completed the compulsory basic education tend to enter vocational education. Here the aim is to produce an individual possessing specialized vocational training. Students who enter the vocational education stream may enter the normal academic educational stream when





**Fig 06 : Children engaged in STEM activities**

necessary. Accordingly in the Finland education method/system there is no obstacle for students to do as they desire or wish, in their education.

In Finland the Eureka Science Centre at Vantaa which is located to the North of Helsinki, is an effective place from which everybody irrespective of whether they are small or big (young or old) can gain experience. There opportunities are available for anybody to learn scientific concepts and test them out individually. Most of the STEM activities presently much talked about in Sri Lanka, may be tried out at this Centre. For this purpose maximum use of Technology is employed. Here it was possible to observe the way in which small children who are accompanied by their parents try out the various activities with great enthusiasm. In this manner it is possible for the students to gain a



great deal of knowledge in addition to the experiences they obtain from schools.

In a country such as ours which tries to “market” STEM calling each and everything STEM, there are many lessons we can learn from Finland. On the whole even though the educational method in Finland is based to provide the STEM experiences, they define it not as STEM but as a method providing life experiences to students. Therefore the students

do not try to determine whether they apply science or mathematics in the activities they carry out. Instead they apply the knowledge or experience they have gained for the relevant instances as required to carry out their work and for creations. They try out the knowledge they have gained for practical purposes. They experiment with it and thereby gain skills suitable for their future. This is why Finland is included as one of the countries practicing the best method of education in the world. Finland practices STEM while not actually calling it as such.



**Ms BWG Dilhani**  
Assistant Director  
Science Branch,  
Ministry of Education  
0714440691  
dilhaniganga@gmail.com

