OBSERVER magazine

10 OCT 1986

COMPUTER SCIENCE TEACHING BEGINS IN KINDERGARTEN

CERTAIN games are an excellent way of initiating children into the complex world of computer science. They are easy and quick to learn, cheap, and save having to buy costly machines. So, by incorporating them into school curricula, in countries with limited economic means or in richer countries where some schools cannot however afford computers, children may be introduced at an early age to the basics of computer science.

Computer science applied as an educational method enhances the quality of teaching. A school computer helps to inculcate structured and ordered patterns of thinking, to stretch and open the mind and thereby generate more creative thinking.

Until now, the advantages of this form of education have been subject to the acquisition of computers. But in Latin America where the overwhelming majority are denied access to the use of such machines, other solutions had to be found if this disadvantage is not to be further aggravated.

UNESCO's Regional Office for Science and Technology for Latin America and the Caribbean (ROSTLAC), centred in Montevideo, in collaboration with other bodies is promoting the distribution of a model designed by an Argentinian engineer, Raul Dorfman, based on the sensory-motor processes. Traditional games, such as hopscotch, dice or snakes and ladders allow children in a natural and enjoyable way, to learn and practice the logical processes and symbols of computer science.

The procedure, which has proved successful, is to acquaint pupils while accomplishing ordinary gestures, with the process that goes on inside a computer. The right games can simulate situations calling for basic logical structures such as 'correct—wrong', 'if—therefore', 'and' 'or'

Children can be asked to analyse activities presenting different situations such as "water flow—tap" "cars—traffic lights" "lamps—switches". The concept of flow and stop-flow is thus posed. For example a car can get in or out of a garage door according as to whether the latter is open or closed. The situation posed is a theoretical one. These exercises stimulate binary logical thinking. Two options are possible, one being the complement of the other. The notion of 'and' is thus introduced: To get into the house, I have to insert they key into the lock and open the door; to make my way to the square, I have to cross the road and the bridge The process in the same for 'or'; If I want to read I pick up a book or a newspaper; I go to school on foot or by car.

Through the exclusive use of structures made up such terms as 'or' and 'and' a model of composite logical expressions can be built up introducing notions of sequence and relationship upon which computer language is based.

The exercises are understood and accomplished horizontally (the child walks over small tables or diagrams traced out on the floor) and then transferred to a vertical plane on magnetic wall charts. The materials used for this purpose are within reach of most school institutions.

But the methodology— which is not the only one since there exist other similar ones—teaches more than is apparaent at first sight. Its apparent simplicity is only achieved after a solid understanding of the analytical and synthetical process underlying highly complex structures. From an educational point of fiew, it has greater impact because it leads to a pattern of thinking which interprets reality and later promotes a systems approach acquainting the pupils with the characteristics of the present and future world.

A country's road network the ecology of a river basin can be studied to greater advantage through systems analysis. From kindergarten on wards through simple games, the basis is laid for a creative way ot apprehending reality. — S.B.