□ MICROCOMPUTERS IN THE SCHOOL □

Is HAL taking control of the classroom? Anyone who has seen the Stanley Kubrick film might think of HAL on seeing the rate at which microcomputers are becoming a part of our schools. This revolutionary trend is transforming the work habits of pupils and teachers alike. Fifteen years ago, when large computers began to be used in education, what is known as programmed education was their only and occasional application. Today, the use of microcomputers makes a far wider range of uses possible. Pupils now have access to programming, word processing and communications as well as the lessons presented on the computer. They can be used not only as a teaching tool, but also as an instrument to monitor the progress of the pupils.

The challenge for the pupil is learning how to use this instrument. Computers are used everywhere as a means of more conveniently transferring and managing information. Many microcomputer applications are available for children in schools. Among these are courseware, programming, robotics and custom software of the word processing and communication variety. With the abundance of resources available, educators are faced with a twofold question: what is the most useful combination for the pupils, and how best can activities be organized to incorporate the use of the computer? The primary question here is how to integrate the computer with educational activities.

The most accessible and the easiest means is to use courseware by which the pupil can learn through exercises shown on the screen. Courseware is a sort of programmed lesson in which the learner is self-reinforced. For the teacher, it is the equivalent of a lesson given to the class. In this manner, teachers who are unfamiliar with electronic data processing can understand it and incorporate it with their teaching. The courseware available on the market is usually geared to a particular lesson and the programs are therefore relatively short.

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Teachers who have some experience with microcomputers usually know how to use custom software. They might use microcomputers in their classes as a work instrument for the pupils in their learning exercises. For example, classes that correspond with another class outside the school will find word processing a useful and interesting aid in preparing their letters. This kind of application is significant to the child, because he can clearly see its usefulness.

Some classes correspond with classes in another country. Pupils in a Beauce school found computer communication techniques a fascinating aid in corresponding with a class in Belgium. They used the most modern technologies and were able to carry out a direct verbal exchange with their counterparts in Belgium.

As Seymour Papert, the inventor of the Logo programming language has well said, Logo is *a tool to think with*. Programming leads the child to analyze the different stages of a problem, to break it down into sequential parts and to translate into a language the various stages executed by a microcomputer that understands the language. Logo has brought a revolutionary change in this way, enabling elementary school pupils to program a computer, a task that previously could be done by secondary school and university students alone. Logo has made this possible by enabling the child to produce a drawing on the screen. Children are interested in drawing, and if they are careful they can instruct the machine to make a drawing itself. The use of programming in schools thereby assists in the development of algorithmic thinking, or the ability to analyze, plan and produce something. In order to reach a set objective, the pupil must think about it in terms of the form in which it presents itself.

It is even possible for children today to engage in robotics. Various companies have developed material that can be used by children to build the essentials of a machine that will obey