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# COMPUTERS IN THE CLASSROOM

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When the computer was introduced into Singapore, its obvious power for computing, data storage and its reported indispensability for scientific research, brought plenty of advocates for the use of computers as an aid for teaching and learning. Today, computers are increasingly evident in everyday life in Singapore, and it is undesirable that its invasion should halt at the door of the classroom. Today's children are growing up in a world in which computers are pervasive and largely visible. Few people know how the computer works (as with the telephone, television, videos and satellite communication), but all can appreciate how it is applied and will use it to manipulate and process information. The onus is therefore on teachers to seize the opportunity and guide pupils, or they will be left behind. The limit to what can be achieved in this field is determined by the ingenuity and imagination of teachers and/or pupils writing, editing, and using computer programs.

Discussions with older adult members of the community seem to indicate that a common myth held by some of the older generation is that computers are for whiz kids, mathematicians, physicists and the like. However, many people seem to grow in confidence and commitment once they have gained some insight, however limited, into the nature of the machine (Sledge 1979).

There are real obstacles to the use of computers in the classroom – but the most serious obstacle is *teacher resistance* – partly owing to computers being perceived as fast inhuman mechanical devices, partly because of perceived threats of security or ignorance, but in many cases, it is a general resistance to educational innovation (Gerhold and Kheriaty 1981).

## **Limitations to the Use of Computers in the Classroom**

In spite of the increase of computer availability and awareness amongst administrators in schools, limitations to its use in the classroom include:

- Teachers being reluctant to venture out of their traditional teaching methods and practices.
- Lack of direct access to micro-computers in the school – they are usually locked away in a special room.
- Teachers being put off by unfamiliar methods of operation, complicated machinery and problems of setting up the whole system with peripherals in the classroom.
- Problems of selecting the equipment, maintaining and enhancing it.
- Teachers being easily put off by disruptions caused by systems failure or program failure.
- Although there is no lack of suitable software in the market, there is a lack of adequate documentation of software packages and of suitable evaluative reviewing of the applications of these programs from the instructional point of view.
- Software from overseas (UK, USA or Japan) may not match teachers' own needs, style and lesson content. Ideally, therefore, the teachers should write their own programs. But teachers do not have the required time nor the expertise to do so.
- This is not helped by the necessity of having to learn a foreign language before one can even begin to program simple routines.

In schools, computers can be used for a variety of purposes to motivate and encourage active discussion and participation. It can create greater confidence and encourage self-learning in students. Computers can be used for:

- Problem solving in mathematics and the sciences.
- Simulation and models in the sciences, arts and the humanities.
- Educational game playing.
- Demonstrations.
- Consolidation and/or remedial work.
- Computer Assisted Learning (CAL).
- Computer Managed Instruction (CMI) for testing.
- Control devices for science equipment in experimentation.

- Programming in computer studies.
- Art and graphics with Computer Aided Design (CAD).



Many of us, when we want to learn how some mechanism works, simply play around with it. What better way therefore to teach teachers about computers than to introduce them to some CAL packages in their own subject areas and allow them to try it out, to review and evaluate its usefulness as a teaching tool. Teachers should be encouraged to look at each software package critically using the following criteria: (a) the relevance of its stated objectives, and (b) the extent to which it gains learner attention, provides direction and reviews prerequisite knowledge.

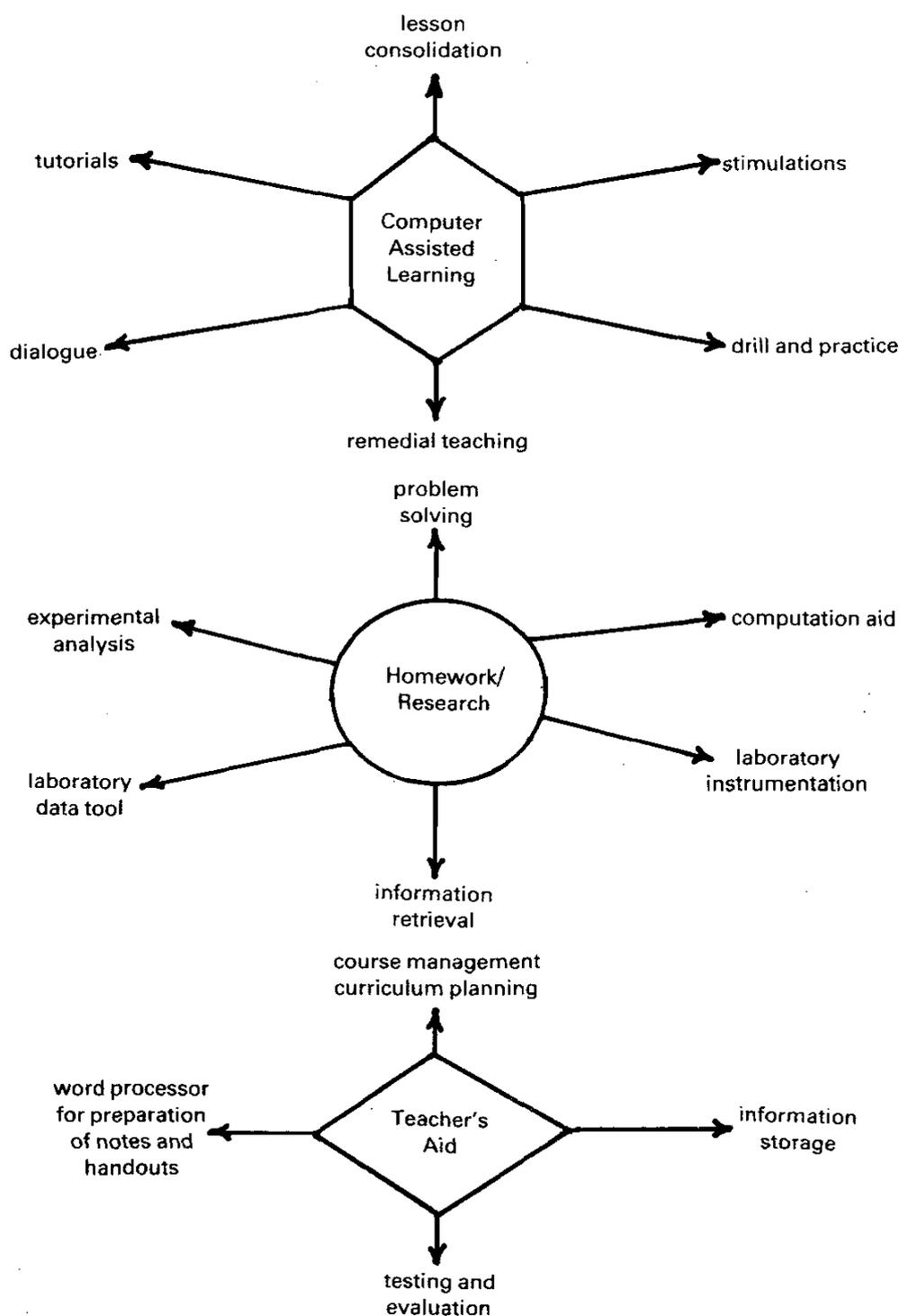
In order to maximise the impact of teaching in the classroom, I believe that the teacher should use all the teaching aids possible to develop their students' fundamental understanding of the topic.

( the form of the learning task )  $\longleftrightarrow$  ( the nature of the student's thinking )  $\longleftrightarrow$  ( the learning outcome )

influences                      influences

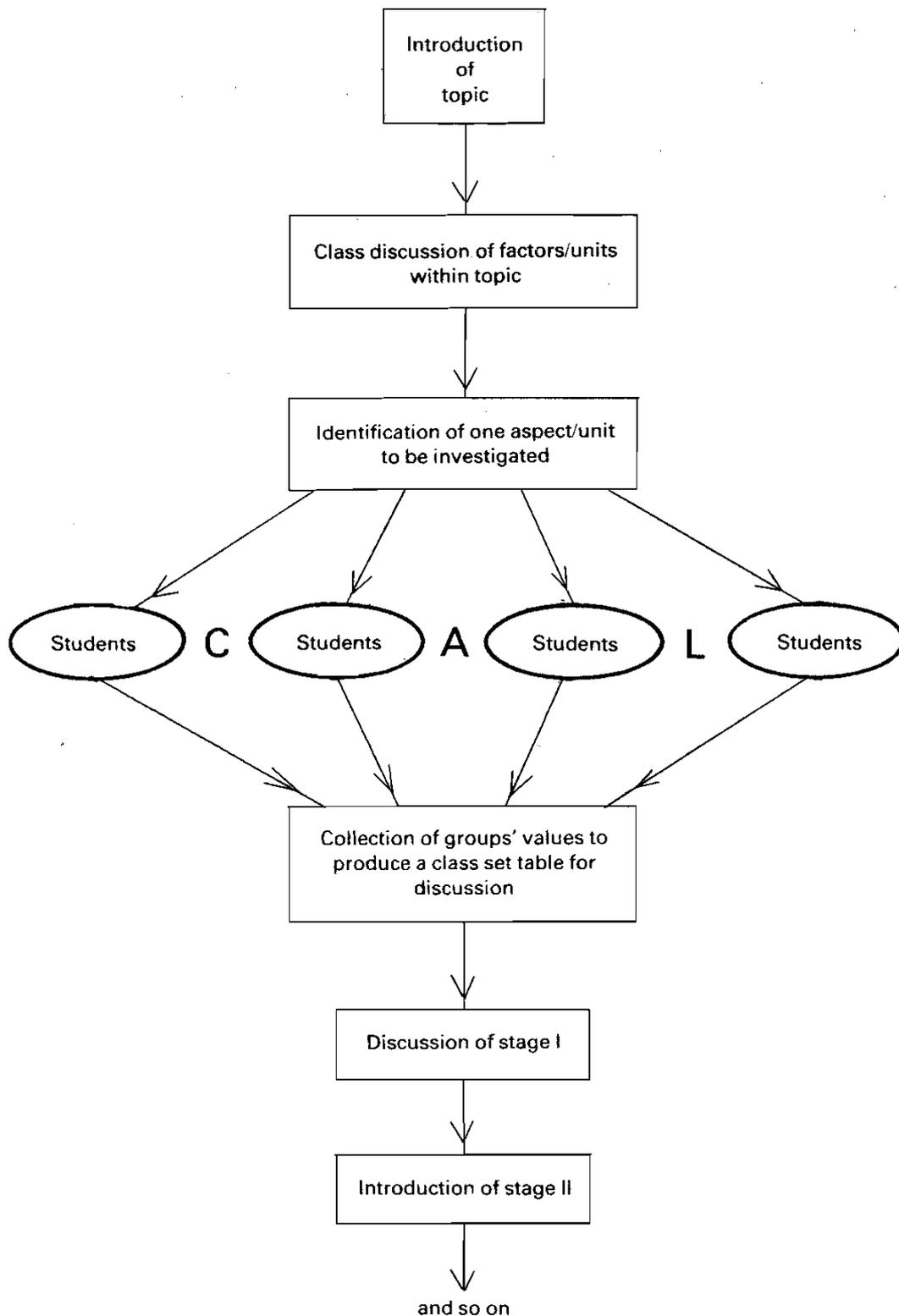
Most instructional tasks and decisions described in many CAL packages have been designed to be used as and how the teacher decides. With the use of CAL, feedback is less stark. There are no right or wrong answers as such. The student arrives at his own value judgement. Figure 1 illustrates some of the uses of computers in the classroom. Figure 2 illustrates with the aid of a flow chart how a CAL package can be incorporated as part of a lesson.

**Fig. 1. Uses of computers in the classroom**



If micro-computers are to achieve their potential both in education and in industry, teachers must become computer literate. Pre-service and in-service computer education courses will help teachers acquire the competence necessary to use the computer in teaching. Professional organisations and journals should include more articles on the use of computers in the classroom as well as reviews of educational software available. This implies the necessity of adequate documentation of CAL not just at the technical level but at the instructional level as well.

**Fig. 2. Classroom use of CAL**



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