

Computer-assisted learning in language and reading

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Following the development of the cheap, easily available microcomputer, the last few years have seen the rapid development of computer-assisted learning (CAL) in secondary and, more recently, primary schools. There has, however, been a tendency for this to be based on the 'drill' program, and for computers to be used mainly for highly structured activities such as basic mathematics. The question needs to be raised as to how teachers of reading and language might reconcile this use of the computer for 'drill', with the desire to instil more creative and thoughtful modes of working into their children.

It has to be said first of all that the computer is a significant advance in this respect on the teaching machine. It opens up much greater possibilities of a varied response based upon a child's answer. It is thus capable of interactive, rather than simply reactive, teaching, and this possibility needs to be exploited to the full. This article will describe some of the possibilities for using the computer in this way in the classroom, focusing specifically on the development of reading and language.



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Using the computer for activities which may already be part of the reading curriculum

Many activities which may previously have been presented to children in the form of work-cards can be programmed into the computer. If the computer is used by small groups rather than individuals this combines maximum use of the machinery with wide possibilities for group discussion of the task in hand (see Figure 1). Activities which could be conducted in this way include cloze procedure, sequencing, and language games.



Figure 1. *Computer-assisted learning activity. Photo by courtesy of Mr Brian Wildsmith, Edge Hill College, Lancs.*

Cloze procedure

It is possible to program the computer to select the words to be deleted either on a lexical basis (it can delete nouns, verbs, adjectives, etc. if these are signalled in the program) or on a numerical basis (every tenth word, every seventh word, etc.). It is thus possible to get a wide range of cloze texts from one passage typed in by the teacher. The choice of deletion type and frequency can be made by the teacher or the child, and the computer can keep a record of the number of mistakes a child or group of children may make. The program can cater for the one best answer, using a multiple-choice format, or, perhaps more in keeping with the aims of cloze, it can cater for a range of suggestions for each deletion by comparing the children's response with a range of possibilities previously specified by the teacher.

Sequencing

The sequencing activity which requires pupils to sort out a set of instructions, for example, into the correct order by reading carefully and *thinking* about what they read, can be done very easily by means of a computer program. The computer is programmed with a 'best order', and compares the pupil's efforts with this. It is, of course, quite possible that the pupils will provide an order which makes sense but is not the order the computer wants. It can be very beneficial for children to realize that a computer is only a machine after all, and does not necessarily have access to all the right answers.

One interesting feature of a sequencing program is the possibility of presenting the sections of text to the pupils in a variety of random orders. A mechanism can be built into the program to enable the pupil to ask that the computer reorders the sections in another random way. This can be fascinating to children and give scope for a great deal of discussion as the children compare the various orders.

Language games

There is a wide range of computer games which encourage children to use language with precision, and to pay close attention to words and their constituent letters. 'Hangman' is a very popular example in which children's attention is drawn very closely to the spelling of words, and they are encouraged to guess at letters to complete sequences. For example, if they have already guessed 'st-ti-', knowledge of the most likely structures of English words will get them the rest of the way. The ability to do this is a much underestimated language skill which has an important role in fluent reading, and in accurate spelling.

An important point to be aware of when designing this type of activity is the degree to which the computer enhances the exercise. It is possible to become over-enthusiastic about the use of micro-computers and to use them for activities which, in fact, would be better done without them, in a more traditional way. Having said that, it is important to realize the extra flexibility that using a computer can give. With cloze texts, for example, the computer can present, more or less instantaneously, a range of exercises based on the one text input by the teacher, which would certainly require far more preparation time if hand-prepared.

Using the computer in novel ways

There are many activities in which it is possible to engage children for which a computer is an almost essential requirement. These fall basically into two types. First there are what might be called logic-based activities, and second there are data-based activities.

Logic-based activities

The basic format of these activities is the presentation by the computer to a group of children of a situation to which they have to work out some form of logical response. The computer reacts differently according to the children's response and poses a fresh problem based on this. This uses to the full the interactive capabilities of the computer.

The commonest form of this activity is the so-called 'adventure game'. Typically, in these games, the participant is placed in some kind of closely defined situation (dungeons and haunted castles are quite popular), and is required to extricate him- or herself from the situation and/or to perform some task such as collecting treasure. Participants proceed by making a series of choices as to actions, and the computer provides the results of these actions and presents new situations which follow from them. Naturally, these games require participants to exercise logical skills to determine the best course of action in each situation. Where the games have real potential for developing language skills is in their use with groups of children rather than with individuals. As the group confronts situation after situation they are required to arrive at joint decisions which are based on the facts at their disposal. They are thus using their language skills to solve realistic problems, and problems which certainly engage their interest. What these problems are can be determined by the teacher. Certainly, a wide variety of these 'adventure' games is available. It is probably best to choose those games which rely on verbal descriptions of situations rather than on graphics, since these demand careful reading by the pupils as well as purposeful discussion.

Data-based activities

Another common form of computer game with educative potential is that based on the perception and selection of certain patterns from large amounts of data. Typically the game will present a fixed number of objects, each with a number of attributes. The participants in the game will have to pick out objects which satisfy certain required criteria, or eliminate objects from their search which do not satisfy these criteria. An example of this kind of game is the 'rogues' gallery' activity, in which the computer contains details of a number of suspected criminals. Each criminal has certain attributes — hair colour, height, weight, shoe size, and so on — and more subjective attributes, such as preferred shirt colour. The player has the role of detective, and is given certain clues about a robbery which, it is suspected, has recently been carried out by one of the criminals. From the given clues, the participant has to eliminate suspects and eventually detect the real culprit. This is done by interrogating the data base in such a way as to maximize the information at the participant's disposal. Again, this activity can be done without using a computer — punched cards and knitting needles suggest themselves — but it is important to note the increased flexibility a computer will give. It will clearly remove many practical problems of sorting

out data, and can also present clues in an order determined by the line of a 'detective's' investigation, rather than in a completely predetermined order.

This type of activity is similar, of course, to the Twenty Questions game, and indeed can be undertaken under some kind of limit on time or number of questions. Like that game, it encourages participants to think in structures rather than in isolated units. Again, a major benefit will be the discussion and decision-making processes involved if the game is played by a group of children rather than by individuals. The participants are required to read carefully the clues presented by the computer, and to make decisions based upon these clues. They are thus using reading in a problem-solving situation.

Conclusion

This brief outline of several possible computer-based activities for developing reading and language has attempted to suggest that computer-assisted learning need not be concerned entirely with the drill type of exercise. Naturally, there is a place for the drill type of exercise, but it is hoped that the computer will be seen as having far greater potential for developing reading and language skills than this.

What the activities suggested here have in common is an involvement of participants in problem-solving situations. They all require their participants to use reading and language in a way that cannot be other than meaningful because the problems they present are meaningful. Moreover, they all lend themselves ideally to group work centred on the computer. The computer can thus be used more efficiently than if its use were confined to one child at a time, and the users can gain from the discussion these activities will engender.

There are many other possibilities for the use of computers in the classroom, not least being the important dimension of information technology they open up. One of the obstacles to their increasing use is the availability of hard- and software, although this is clearly being overcome in many areas. Another important obstacle is the suspicion many teachers may have that computers are simply a revamped version of the programmed learning ideas prevalent in the 1960s but generally little employed in schools. If one of the reasons for this lack of acceptance of programmed learning was the fear that drill would replace creative learning, then hopefully this article may help reassure teachers that computer-assisted learning does not imply this at all.

