

Some Advantages and Disadvantages of Developing Reading Skills with Computers

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This paper examines some of the arguments for and against using CAL (Computer Assisted Learning) in the development of reading skills. The advantages are classified under the headings Control, Interaction, Power and Versatility. The disadvantages are grouped under Affective Demands, Logistics and Methodological Limitations. Drill techniques are criticised, and areas of new development speculated upon.

INTRODUCTION

Behind the following discussion of the advantages and disadvantages of computers for developing reading skills there lie two basic questions:

(a) Is it *possible* to use computers? Can CAL exercises be used, for example, to develop vocabulary attack strategies or to practise features of discourse? Here the answer is generally 'Yes'. The computer is an abstract machine, and can be programmed to present many differing forms of language practice.

(b) It is *sensible or appropriate* to use computers for such purposes? Should one use them because they are there in the Resources Centre, or because they can be expected to increase learning, enhance opportunities for learning, or raise motivation to such a degree as to justify the expense and effort? Many of these rather more difficult questions remain unanswered (cf. Eastment 1985: 63).

In the following section, the strengths of computers will be discussed.

STRENGTHS

1. Control

Control here is used in the sense of 'learner-control', following the humanistic-communicative tradition at present in vogue. In the Venturereader suite of reading programs written at the University of East Anglia by the author and David Clarke, the students start off with a general Menu (or list of options) and can themselves choose which practice type or skill area to use. Thus, they can opt for one of a number of standard reading exercise types, e.g.

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- pre-test on a range of texts — answering questions before reading the text
- scanning — looking through the text for the answers to particular questions
- identifying the main point of a section of text, using multiple choice
- guessing the meaning of unknown words (inferencing strategies, vocabulary games etc)
- practising relevant grammatical or discoursal relationships such as deixis

The use of a Menu to give access to a range of options is standard procedure with computers. The *Venturereader* course also offers access to mini-databases, so that a student can look up information on how to recognise nouns in texts, or get information about certain difficult words (definition, examples, collocations, semantic field, special notes). All this information and practice material is instantaneously available to the learner.

Many other examples of this learner control can be given; the facilities on offer depend on the aim of the program. Thus, depending on the software in use, students can switch the sound on or off, change the colour scheme of the screen display, get a printout of how far they have got in the adventure game they are playing. In CAL practice focussing on writing, there are commercially available packages designed for use in offices: spelling checkers, synonym finders, grammar checkers, style improvers. IBM PC machines and their clones are particularly rich in this splendid applications software.

To give the student this degree of control over his learning is to encourage the development of autonomy. Once they have mastered the system, students usually enjoy working with computers – which give them immediate feedback, and which do not publicise their mistakes to the whole class. In encouraging concentration and in providing motivating power, the computer can provide an authentic learning experience. (For Kemmis et al 1977, ‘authentic learning’ is both successful and valued.)

In the area of reading, our experience with *Venturereader* – and that of colleagues – suggests that the tight control which CAL programs generally offer is good for practice in:

- (a) particular reading skill areas, such as discourse relationships through unjumbling texts, or inserting phrases back into passages;
- (b) vocabulary recognition strategies as described in Williams (1985); and
- (c) speed reading practice, as in programs written by Rope (1984) and in the *Venturereader* package.

To talk in terms of 'student control' is to omit the considerable control which CAL gives to the teacher as well. Indeed, Murphy and Appel (1977) reported that teachers liked teaching languages with PLATO (a powerful mainframe CAL system which permits the teacher to put in her own exercise material) precisely because of the degree of control it gave them. Similarly, Nelson et al (1976) approved of CAL because it "narrowly defined responses demanded of students in language exercises and drills". Learner control was, perhaps, not so fashionable in the US in the mid-seventies, but there are useful intermediate positions between total student control and teacher domination. In much EFL CAL practice today, for example, the teacher picks the texts and practice material, but the students work on it independently. Thus the teacher defines the boundaries, but the student has comparative freedom within those boundaries. The power and responsibility are shared.

2. Interaction

Man-Machine Interaction

The interactive potential of CAL has been extolled for the last twenty-five years or more. For example, Rigney (1962: 156) writes: "It is . . . an attractive notion that a computer can be programmed to interact dynamically with one or more students."

Interpersonal Interaction

In talking about 'interaction', Rigney and his contemporaries were thinking in terms of communication between man and machine, and it has been largely in these terms that CAL has developed. In language acquisition, however, most interaction is between people. Indeed, for Wells and the interactionists, the very purpose of first language acquisition is to make interaction possible (Wells 1981:16). Interaction is the goal and language the means. The central role of interaction in language acquisition has been emphasised in recent research (e.g. Ellis 1984), and in the whole tradition of communicative teaching.

The use of computers within interactive settings, as an element in a group practice, is well established. Here is an example of how a popular simulation 'Kingdom' has been used for integrated skills practice:

The King and his cabinet, sitting at a table, send an emissary to find out the state of the country's economy from the computer. The emissary reads the screen, takes notes, and reports back to the cabinet. They consider the report and other papers, discuss what to do, and then instruct the emissary to act on their decisions, typing the appropriate material into the computer, and reporting back on what happens.

In this procedure, the reading practice is part of a sequence of tasks carried out by the participants.

Reader-Text Interaction

Another form of interaction which is particularly important in the context of reading is between reader and text (Widdowson 1979: 173-181; Papalia 1987). Thus, in the Venturereader suite, we have been concerned to set tasks or ask questions which oblige the learner to go back to his printed text. For example, in the section on ascribing meaning to unknown words, the students are asked to look at the word in context on the page and to work out the answer to certain questions (What is the word-class? What clues do you get from the immediate context? etc.) In this approach, the computer can be conceived of as an aid, supplementing the printed page or other teaching materials, and not providing the total learning environment. This approach would see it as the teacher's task to create the learning environment, using the computer as an element within it just as she might use integrated skills practice or an overhead projector.

Thus computers can play a variety of interactive roles. They can promote interaction of various sorts – between man and machine (which is generally absorbing and motivating), between people (which is likely to promote language acquisition), and between reader and text (where the computer often plays a supportive role).

3. Power

The calculating power of computers is legendary, together with their capacity to search speedily through databases or print text up on the screen. In reality, however, the microcomputers generally used for CAL work are essentially toy instruments, sometimes even derided by computer scientists with their considerably more powerful mainframe computers.

In the development of reading skills, small microcomputers of, say, 32k memory (i.e. with the capacity to store about 32,000 letters in their memory) can be useful for the forms of practice mentioned in 1. above, such as the various forms of text manipulation practice like Cloze or Storyboard. In general, these are 'closed' exercises in the sense that the student has to rediscover the hidden missing word, and that there is only one correct answer. But if the task is to fill the gap in:

I love . . . bacon.

and the student types *Danish* or *eating* he may be frustrated to be told that:

The answer is *streaky*.

There are some programs that allow the teacher to specify several possible 'correct responses', but it is often impossible for her to anticipate all the zany responses that may come up. In other words, computers can actually be constraining and limiting. It is not enough simply to blame the software, for the problem also derives from the

limited power of the machine and the near-impossibility of anticipating all possible responses.

In a classroom situation, on the other hand, the teacher would presumably handle student suggestions, however wild, without too much difficulty. Indeed, work with computers tends to make one realise how flexible and cognitively powerful human teachers are.

Thus computers can be described as powerful but only within certain restricted domains. For the reader these include text manipulation exercises, lexical and technical databases, speed reading exercises, and simulations. (The area where the computer can perhaps best give power to the student is in word-processing, but this is more relevant to the teaching of writing than of reading, except in an integrated skills approach.)

4. Versatility

Despite any limitations of memory or processing power, computers are surprisingly adaptable and versatile devices. All the vocabulary recognition strategies described by Williams (1985) could be practised with CAL programs. Some approaches use computers not so much to provide CAL exercises as to serve as a facilitator (Sharples 1985), providing the learner with a toolkit (e.g. sentence linker, story planner, or automatic thesaurus) to help the learning process to take place.

The computer can be most flexible and versatile as a presenter of practice material. As a processor of student responses, however, it is much more limited, as has been discussed in 3. above. If the required answer is *apple*, the majority of systems would reject *an apple*, *aple*, *apples* as wrong.

It would be possible to program the computer to accept slight mis-spellings or the inclusion of articles, but this facility would probably slow down performance a good deal. Carrier (1986) has made interesting proposals about the use of the authoring language Microtext to deal with the problem of answer processing, and this works comparatively well in limited domains such as parts of the grammatical system. Nevertheless – as was discussed in section 3 – it is clear that the human teacher is much more versatile in handling unanticipated and wrong responses in general. This is all the more true since human teachers regularly take into account information about students' personal situations, family background etc., when deciding if and how to correct them.

Not only answer processing but also the provision of Help information is an area where the 'versatility' of CAL is limited. For example, if one looks at a typical version of the text manipulation program Storyboard, one notes:

Answer Processing

The answer is only accepted if it exactly matches the missing word. Thus, 'Pear' instead of 'pear' is wrong.

Help Information

The system will provide: first letter of missing word, the whole word, the whole text.

Such a degree of Help information is very useful. But it is essentially meaningless: the system does not understand the text and cannot provide a synonym, opposite or related word, or give the range of helping clues which a teacher might provide.

It is clear that computers, in the way they are at present used for EFL practice, are very useful in certain areas, but nevertheless essentially limited. To promote the computer as capable of providing the complete learning environment is therefore unrealistic. To recommend its use as an *element* in an overall learning environment, on the other hand, seems a more practicable approach.

WEAKNESSES

1. Affective Demands

The affective demands of working with computers vary with the user. Young learners, on the whole, experience little difficulty. It is generally older users, such as teachers, who may experience feelings of inadequacy or even of hostility to the machines. These attitudes are probably fairly common, and may help to explain the slow spread of CAL.

There are good reasons why teachers do not always welcome CAL with open arms. The introduction of CAL into the classroom does change roles and relationships, by partly transferring to the computer some of the teacher's roles, such as those of controller or knowledge source. Use of the computer to provide access to large databases can be expected to increase as computer power grows, and new technology such as interactive videodisc develops. Students will increasingly gain access to information without having to 'ask teacher'. A more extreme view sees teachers as ultimately expendable and replaceable by computer-based 'Intelligent Tutoring Systems'. (For discussion see O'Shea and Self 1983; and Fox 1984.)

2. Logistics

Access

At a practical level, the biggest difficulty associated with using CAL techniques in reading training or for other language work is getting enough computers. In most institutions using CAL, one machine per classroom (or less) is the rule. Student

access to the machine is generally limited in time and shared with other people. (In fact, students can work at computers in pairs without loss of effectiveness.)

Materials

While a certain amount of software is available, particularly for the BBC and Apple computers, the high costs of programming and the small sales compared with books mean that only a limited amount of software is published (Rope 1985: 67; Mears 1985: 89). Furthermore, programs written for a BBC computer, say, will not work on an Apple or an IBM. Translation programs do exist, but they only work under certain conditions.

Computer Screens

It has been argued in advantages 3. and 4. above that the computer screen can be used in versatile ways. However, it does not look like paper, and presumably reading training should be primarily directed towards reading texts on paper. When one finishes a page in a book, for example, one turns over to the next page. The computer, on the other hand, usually 'scrolls', so that the text you have been reading moves up to the top of the screen and disappears, while the new section of text moves up into view from the bottom. It is much easier to find something by thumbing back through a book than by scrolling back on a computer screen. Books, in fact, are a sophisticated form of educational technology (portability, low production costs, good random accessibility, lack of running costs, durability etc).

Another problem encountered with using computers as a presentational device for groups of students in the classroom is the small number of letters per line which are visible, 20 or 40 being the rule. This means that not much text can be shown at a time, generally around 100 words. Where students are working alone or in pairs, 80 column lines – and thus longer texts – become acceptable, though the clarity of the letters varies a good deal between machines.

A partial solution, adopted in the *Venturereader* package, is to avoid using the computer to present extended pieces of text, but to use paper as much as possible. With this approach, the computer acts as a teacher – asking questions, giving answers and feedback, prescribing tasks, giving access to grammatical or lexical databases etc. Here the computer acts as a sort of structurer of the students' learning.

3. Methodological Limitations

Some of the methodological limitations of CAL have been discussed already, such as the problems of dealing with unanticipated responses. Another restriction is that the computer cannot understand speech, so that most CAL practice at the keyboard is confined to reading and writing.

More insidious has been the impact of the computer on CAL methodology. Right from the beginnings of CAL around 1960 to the present, most CAL exercises have been drills, and in the majority of them meaning is secondary. Although Applied Linguistics and Cognitive Psychology have doubted the wisdom of using meaningless drill as a primary way of learning languages, such drill is still common in CAL practice, legitimated by the technology. In other words, old fashioned, supposedly 'habit-forming' drills are endowed with a new respectability by being put on a computer. The hegemony of drill is more of a problem in writing practice than in reading practice, but a tendency to meaninglessness is an ever-present danger (cf. 4. above).

CONCLUSION

To summarise the argument of this paper: computers are powerful and versatile devices, but they do have a number of disadvantages, carry no guarantee of success, and need to be used with care. Introducing CAL does not make the task of the EFL teacher easier, for successful integration of the computer into the learning program demands ingenuity and effort. Programs exist for the development of reading strategies, for example, and to develop inferencing skills in assigning meaning to unknown words. More 'tool software' will become available, giving readers access to dictionaries, lexicons etc. Integrated reading and writing work round projects, using word-processors and attendant spelling checkers etc, looks a promising area for development.

Computers are known to be motivating for students. To get the best results with them, teachers will need both enthusiasm and discernment.

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