Computer essentials for home and school

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Abstract

This paper considers the need for teachers and parents to collaborate in the use of the computer for educational purposes as they have successfully begun to do in other areas of the teaching of reading. It puts forward several criteria by which teachers and parents can evaluate educational computer software, and goes on to argue that there are a limited number of types of computer programs that are really essential for children to have experience of. These 'computer essentials' are described and their educational value briefly discussed.

Introduction

The middle 1980s will probably be remembered as the era of the 'computer explosion'. The microcomputer has begun to make its mark on our everyday life in a whole variety of ways, but what is perhaps most remarkable is the degree to which it has penetrated our home lives. Evidence suggests that the United Kingdom has the highest proportion of homes possessing a microcomputer of any country in the world (Obrist, 1983). This would seem to indicate a high degree of computer awareness in British home life, although it must be admitted that the greatest proportion of these home computers are used simply as games-playing machines (Obrist, 1985). Running alongside this growth in computer ownership, however, there has also been a growing interest in the educational potential of the microcomputer. Many families acquired their computer for the use of their children, hoping thereby to improve their educational chances. By virtue of a very forward-looking Government-sponsored scheme virtually every primary school in the country now has at least one microcomputer, and many have more than one. The presence of this vast market for educational software has ensured an enormous growth in the quantity of software available, mostly specifically aimed at schools, but significant amounts of it aimed at the home market. Much of this software has been designed to assist in the development of reading and language, which are clearly perceived as areas of major importance in the education of primary school children.

Unfortunately much of the software which has been produced, especially for home use, has often seemed to encourage inappropriate ideas about children's learning of reading and language and its use likely to undo some of the advances which have been made in the last decade or so in the ways schools set about developing these vital skills. There is a clear need for teachers to set about educating the parents of their children in the kinds of computer experiences which would be most beneficial and which would best develop the experiences the children will be getting in their school computer use. It has been shown that the approach of parents towards the reading instruction of their children can

be influenced by carefully planned schemes for involving them, (Hewison, 1982) and the use of the computer would seem to be an important area for developments of this nature. Before this can be done, of course, teachers themselves need to decide their priorities in terms of computer use, and this task is unfortunately not made easier by the sheer quantity of educational software available, and the questionable nature of much of it. To sort through this software is a mammoth task. It is hoped that this paper might help in this by firstly suggesting a set of criteria by which useful software might be judged, and secondly by suggesting that, in fact, the amount of software which both schools and parents actually need, to develop reading and language at least, is limited to around five types of program.

Judging good software

By applying insights from the teaching of other areas of the language and reading curriculum it is possible to arrive at five criteria by which good software for developing reading and language can be judged.

1. Openness. Open-endedness is a well established criterion by which most good educational materials can be judged, and software is no exception. 'Open' software is often recommended in the literature, yet there does seem to be some confusion over the meaning of this term. In fact the term can be interpreted in either of two ways. 'Open' can imply software in which there is no pre-determined content and which simply operates as a tool (Anderson, 1984) upon content which is chosen by children or teacher, or it can imply software which is open-ended in the directions in which it might lead. In the first category we might place programs such as word-processors or data - handling programs, in which the choice of content is determined by the children or the teacher. An adventure game would fit into the second category because, even though its content will be pre-determined, it can be used as a stimulus for a wide variety of activities, according to children's interests. (Wray, 1985)

2. Stimulates creativity and problem-solving. Any good reading and language material should cause children to think, rather than call for a series of rote responses. Educational software has been particularly bad at this, and the majority of programs produced are still at the drill and practice level. What is needed is software which stimulates problem-solving, either posing problems itself, like an adventure game or a simulation, or acting as a tool for solving them, like a data-handling program.

3. Can be used across the curriculum. It is established wisdom now that language development does not just occur in English lessons, and good software should encourage this across-the-curriculum language work. Open software is much more likely to enable this to happen as is software which operates as a tool rather than a delimiter of content. A word-processor can, for example, be used to write about any subject, and a good adventure game can stimulate work in areas ranging from science to creative arts (Wray, 1985).

4. Flexibility. With software, as with any teaching material, the acid test of usefulness is whether the material is flexible enough to be used in whatever way is seen as appropriate by the people using it. Teachers have hopefully by now realised that there is

no such thing as a set of materials which will do all their teaching for them, and educating parents to realise this would seem a high priority for any home - school linking programme. A danger inherent in drill and practice software is precisely that it encourages its users in the mistaken belief that all that is necessary for learning to take place is to put the learner in front of the screen and allow the program to get on with the teaching. This is specially unfortunate in view of the fact that there is no lack of possibilities for the use of flexible software as Anderson's (1984) list of suggestions for the uses of the 'computer as tool' testifies.

5. Encourages co-operation. One of the most significant ways in which our knowledge about language development has advanced in recent years has been in the recognition we now give to the place of co-operation and discussion. It would seem highly desirable that educational software be seen by teachers and parents as a suitable context in which this discussion can flourish. It has been demonstrated that there are arrangements the teacher can make to maximise pupil discussion (Potter & Walker, 1985), but no amount of organisational manipulation will make up for the poor stimulus for discussion provided by some commercially available software.

Essential pieces of software

There seem to be at least five types of software which meet the criteria above and would seem essential for every primary classroom to have available. It will clearly be beneficial if children have experience of these types of programs at home as well as at school. Accordingly the list can also be used as a set of guidelines for schools to pass on to interested parents.

1. Adventure games / Simulations.

The power of the adventure game and of the simulation in stimulating discussion and problem-solving in children has been well documented (Bleach, 1985). There are several case-studies now available of classroom work with adventure games involving fantasy (Potter & Wray, 1985) and with simulations based upon realistic situations (Whittington, 1984). These programs put great emphasis upon the ability to read the screen very carefully, and often to make inferences on the basis of that reading (Wray, 1985). It has also been suggested (Hart, 1984) that there is a great deal of potential in encouraging children to devise and program their own adventure games. There are now available several 'write - your - own - adventure' programs, which seem to fit perfectly the criteria of openness and stimulus for thinking which were established earlier. What a useful home - school activity it would be for children to collaborate with their parents in devising at home an adventure game, which could subsequently be used by their classmates at school.

2. Word-processing.

Recent work on children's writing stresses the encouragement of re-working and re-drafting (Graves, 1983). The problem with this is, of course, the sheer physical drudgery of writing and re-writing (Wray & Gallimore, 1986). A word - processor takes away the physical problems of writing and can genuinely free children to concentrate on

composition and enhancement of quality. Studies have begun to be reported which suggest the success of word-processors in junior schools (Broderick & Trushell, 1985), and with very young children (High & Fox, 1984). A not insignificant benefit of the word-processor is the ease it provides of producing multiple copies of a piece of writing. This means that copies of children's writing can be sent home with them as a matter of course, and children can carry on editing and redrafting with the help of their parents. Home - school co-operation can thus take place even if there is no computer in the home. Clearly though, if there is a computer with word - processing facility available at home, then children will appreciate all the sooner the usefulness of it as a tool for writing, and more rapidly acquire some of the techniques for exploiting it.

3. Data-handling.

Handling information is already part of most children's experience in schools, even if limited to the project on ourselves in which they collect information and display it as a series of graphs of children's heights, weights, spans etc. Again the computer is ideally suited to tasks of this nature, and can allow children to handle data in quantities and with results that they could not otherwise manage. The adaptation of the 'ourselves' project to the computer has been described by Johnson (1984), and Ross (1984) has demonstrated that the computer can make possible the analysis by children of complex collections of data which would otherwise be beyond them.

Data - handling is the application of the computer which is most familiar in the everyday world, although many people view with some concern the proliferation of computerised data - bases containing all manner of personal details. Much of this concern is justified, although a significant proportion must stem from simple ignorance of the way computers work. Giving children experience in school and at home in data manipulation and analysis, and even more usefully, in designing and constructing their own databases might be a useful way to alleviate some of this fear in future.

4. Information presentation.

As well as gaining practice in the design, construction and manipulation of collections of information, children should also become familiar with computerised means of presenting information, that is, with the tools of information technology, such as Teletext and Viewdata. Use of these systems will gain in importance as time goes on, and their use is already an essential feature in many walks of life. Many homes which do not have access to a computer will have a television set capable of receiving teletext, and children will often be very skillful in the operation of such sets. Having a computer available, though, allows use of such systems to go beyond such essential, but fairly passive activities. 'Teletext emulation' systems, of which there are several now available, allow children to design and present their own 'pages' of information and use them in the compilation of school magazines, project reports, and as a vehicle for information-exchange between schools, and between home and school. There are many possibilities for development here, not least being the presentation for parents' evenings of a rolling, on - screen class or school magazine.

5. Planning logical procedures.

It is becoming clear that, as well as being taught by, or learning through the computer, children should also be given the chance to teach the computer to do things in a logical manner. Anderson (1984) characterises this as 'computer as tutee'. There are several possible computer environments, or 'Microworlds' (Papert, 1981) in which this is possible, although possibly the most famous of these involve the use of the computer language, LOGO. A great deal has been written describing the possibilities of this language as a vehicle for problem-solving and for developing a healthy attitude towards mistakes. It has been suggested that the use of LOGO with children can 'promote language interaction among children' (Marshall, 1984), and it is this aspect which assures its inclusion in this list of five essential types of software for developing language and reading.

Conclusion

This paper has attempted to do two things. It has firstly outlined a set of criteria which it is hoped may be found useful by teachers and parents alike in selecting and evaluating educational software from the vast range which is now available, particularly that which purports to develop language and reading. Secondly, it has put forward the idea that there is, in fact, a limited range of software that is really essential for use with children. It is felt that the five types described here meet the requirements of providing an adequate introduction for children of the range of uses of the computer in the world outside school, and also of facilitating valuable reading and language activities in their own rights. A child who gained experience in these five areas at home and at school really would be being prepared for the world of new technologies into which he must venture.

References

Anderson J. (1984) The computer as tutor, tutee, tool in reading and language. *Reading* 18(2) pp.67-78

Bleach P. (1985) Using Magic Adventure in the classroom. In Potter F. & Wray D. (eds) *Micro-Explorations (1)* Widnes: UKRA.

Broderick C. & Trushell J. (1985) Word processing in the primary classroom. In Ewing J.(ed) *Reading and the New Technologies* Oxford: Heinemann

Ewing J.(ed) (1985) *Reading and the New Technologies* Oxford: Heinemann

Graves D. (1983) *Writing: Teachers and Children at Work* Portsmouth, NH: Heinemann

Hart R. (1984) The tombs of Arkenstone. In Open University (1984) *Micros in Action in the Classroom* Open University Press

Hewison J. (1982) *Parental involvement in the teaching of reading*. Remedial Education 14(4)

High J. & Fox C. (1984) Seven year olds discover microwriters. *English in Education* 18(2)

Johnson J. (1984) Using the computer for data-handling. In Open University (1984) *Micros in Action in the Classroom* Open University Press

Marshall P. (1984) *Logo at Clitterhouse*. In Open University (1984) *Micros in Action in the Classroom* Open University Press

Obrist A. (1983) *The Microcomputer and the Primary School* Hodder & Stoughton

Obrist A. (1985) The microcomputer in home and school. In Ewing J. (ed) *Reading and the New Technologies* Heinemann

Papert S. (1980) *Mindstorms: Children, Computers and Powerful Ideas* Harvester Press

Potter F. & Walker S. (1985) Organising group work with a micro. In Ewing J.(ed) *Reading and the New Technologies* Heinemann

Potter F. & Wray D. (eds) (1985) *Micro-Explorations (1)* U.K.R.A.

Ross A. (1984) The strongest conker in the world. In Open University Micros in Action in the Classroom Open University Press

Whittington I. (1984) Ponies, adventures and archaeological investigations. In Open University (1984) *Micros in Action in the Classroom* Open University Press

Wray D. (1985) The adventurous way to use the computer. In Ewing J. (ed) *Reading and the New Technologies* Heinemann

Wray D. & Gallimore J. (1986) Drafting in the classroom. *Primary Teaching Studies* 1(3)