The microcomputer: A tool for personal language learning

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Computer-assisted methods of teaching and learning languages have been surrounded by controversy and debate for over a decade. In 1979, however, microcomputers began to appear in a form suitable for educational applications, offering for the first time an alternative to both the cost and the approach of large computer systems. The impact of the microcomputer has been limited by a number of factors, and microcomputer-assisted learning is still in a relative state of infancy. The main implications for language teaching and learning are only now beginning to be understood, just as the limiting factors are starting to disappear. This paper will assess the present situation and outline some likely future developments in the use of microcomputers in language learning.

Rekenaargesteunde metodes by die onderrig en aanleer van tale is reeds meer as 'n dekade lank omgewe deur meningsverskil. In 1979 egter het mikrorekenaars hulle verskyning begin maak in 'n toepaslike vorm vir opvoedkundige doeleindes. Vir die eerste keer was daar 'n alternatief vir die koste verbonde aan en die benaderingswyse van groot rekenaarstelsels. Die trefkrag van die mikrorekenaar is deur 'n aantal faktore gekortwiek en rekenaargesteunde onderrig is steeds in sy kinderskoene. Die belangrikste implikasies vir die aanleer en onderrig van tale begin nou eers deurdring soos die beperkende faktore begin verdwyn. Hierdie artikel takseer die huidige situasie en omlyn moontlike toekomstige ontwikkelings vir die gebruik van mikrorekenaars by taalaanleer.

1 Introduction

Computers have been used in education for over 20 years (Hart 1981). For much of that period, computer systems remained so expensive that they had virtually no impact on the educational mainstream. Only in the last four years have computers begun to enter a broad range of institutions in the shape of relatively inexpensive microcomputers.

The arrival of the microcomputer has been a very rapid process. As early as 1982, American elementary and secondary schools already had an average of approximately four microcomputers per school (U.S. Department of Education 1982). In simple numerical terms, they already outweigh many older educational media. In my own Education Department at Trinity College, a recent request for an overhead projector led to the discovery that the department owned one such projector, as compared to 22 microcomputers.

Over a relatively short period, computers have thus become available to a broad range of teachers who had little or no previous experience or preconceptions concerning computer-assisted learning. Even the first generation of microcomputers, including the Apple II and the Atari 800, had capabilities which few previous large computers possessed (Holmes and Kidd 1981). These novel features, such as colour graphics and sound generation, pointed towards entirely new applications. On the other hand, these first microcomputers had limitations in memory capacity which made it difficult or impossible to implement some well-established techniques (particularly in the areas of

score recording and automatic routing) from large computer systems.

These factors have all contributed to a period of unparalleled experimentation with the educational applications of computers. Much of the software so far developed for microcomputers is similar to earlier work on large systems. However, there is an increasing emphasis on areas that received little attention in the heyday of mini- and mainframe computers. In language learning, as in other areas, the central question appears to be this: what is the *proper* role of the computer? This paper will present a scheme for categorizing the various roles and then propose an answer to the question.

2 Case histories

To lay the groundwork for an analysis of computer involvement in language learning, we will examine three concrete "case histories". Although these are presented in general terms, they are based on actual examples of language learning software.

We will visit the media centre of a large American college. The college has a number of students from overseas who are learning English as a second language. We step into the first classroom in the centre...

CASE 1: Amina is sitting at the keyboard of a basic microcomputer system. On the screen is a description of a scene in which she, as a student, is introduced to the head of the department. In the scene, it is Amina who must speak first. At the bottom of the screen, she is given a choice of four greetings and asked to select the one she would use. Amina types the letter c to indicate her choice of a highly formal greeting. The computer responds with a word of congratulation and a brief note on this level of formality.

The screen is erased and a new scene is described in which Amina is being introduced to one student by another. From the new choices at the bottom of the screen, Amina again selects a highly formal greeting. This time the computer explains why this is inappropriate and asks her to try again. On her second attempt, she chooses an appropriate greeting.

After working with sixteen scenes, Amina is choosing greetings at the right level of formality virtually every time. She has answered nine out of the last ten questions appropriately–the degree of accuracy that the computer has been waiting for. Instead of presenting the 17th scene, the computer tells Amina that she seems to have no problem with greetings and offers her the choice of skipping to the next topic.

CASE 2: The second classroom in the media centre is also equipped with basic microcomputer systems. A group of four students is staring intently at the screen. Johann, the student operating the keyboard, quickly explains that they are in the middle of an adventure in which their task, as detectives, is to locate some important documents that have been stolen.

Johann turns back to the screen, which contains a description of the back room of a house. The main features of the back room appear to be doors to the left and right, some stairs leading up and a closet under the stairs. At the foot of the screen is a list of choices such as "go through the door on the right", "climb the stairs", and "open the door of the closet under the stairs". After some heated discussion among the group, Johann is told to select c to open the closet door. The screen clears, a new title "In the Closet" appears, and then a description of the closet is provided. It ends with the message that someone is coming down the stairs overhead, and lists the new choices of action, one of which is to close the closet door. Johann reads the quickest and selects that option just in time to conceal himself from the intruder...

CASE 3: Entering the third classroom, we find audio and video equipment in addition to basic microcomputer systems. Rosa, Pierre, and Ahmed, advanced level ESL students, are using a system with a colour monitor and videodisc player controlled by a microcomputer. They are sitting back in their chairs, apparently just watching a movie which we eventually recognize as *Raiders of the Lost Ark*. Several minutes pass while they continue to watch. Suddenly Rosa leans over and taps a key on the microcomputer. The movie stops, then disappears, and a "help" menu appears on the screen.

Rosa explains that she did not understand the dialogue at the end of the last scene. She presses *4*

and the last four seconds of the movie are repeated on the screen before the "help" menu reappears. Still uncertain, Rosa selects "script" from the menu and the script for this segment of the film is shown on the screen. A word in the script is entirely new to her, so she selects "vocabulary help" and an explanation of the word is displayed on the screen. Finally satisfied, she selects "continue" from the menu and the film begins again.

3 Computer roles in language learning

This paper will attempt to clarify the debate over computer roles in language learning by establishing three broad categories. Based on the relationship of computer and student, computer-assisted learning activities may be classified as *instructional, collaborative,* or *facilitative.*

3.1 The instructional role

The *instructional* role is the one which will generally be most familiar to those who have worked with older, large computer-based language learning materials. It is also the best-documented in terms of proven effectiveness (Ragosta et al 1982). The first case history illustrates some of the features often associated with this role. Instructional courseware typically has a clear set of learning objectives, generally obvious to both students and their teachers, and a very carefully planned instructional sequence based on the mastery of intermediate objectives as stepping stones to the final aims. In much of the instructional courseware, the computer either takes the role of teacher (tutorial programmes) or drill master (drill-and-practice programmes). Students take a very active role, but they act as responders rather than initiators, trying to supply the response that the computer is expecting. Sophisticated instructional programmes, as in the first case history, are designed to branch so as to adapt appropriately to students' achievements or difficulties. Hence they are generally intended for students working individually at separate computers.

3.2 The collaborative role

The second case history illustrates some aspects of *collaborative* courseware. In this role, the computer is no longer the "teacher" or "leader". Instead, it may typically create an environment in which learning can occur. Students assume much more responsibility for initiating activities and

learning from them. Typical examples of collaborative courseware are adventures, simulations, and modelling programmes.

The instructional objectives of collaborative courseware are often expressed in much more general, high-level terms. For example, one of the main objectives in the second case history is to encourage and develop rapid, accurate reading skills. A second objective is to develop understanding of expressions for spatial relationships. In terms of instructional design, the students' progress through the materials will no longer be measured in discrete steps with appropriate branching. Rather, the linguistic planning involves the careful selection of lexical, structural and functional features appropriate to the students' level — the creation of the environment in which they will operate.

Because collaborative programmes are generally holistic in nature, not depending on discrete learning steps, they permit and sometimes require use by groups of students rather than individuals. In group situations, entirely new types of learning objective may arise. In the case history, the group discussion generated during the adventure is an extremely valuable aspect of this type of courseware. However, the courseware can also be used by individuals.

3.3 The facilitative role

Both instructional and collaborative programmes generally incorporate deliberate teaching/learning strategies. In their purest form, however, facilitative materials are "empty" of teaching or learning strategy. For this reason, they should be of great interest to proponents of acquisition-based approaches to language learning (Krashen 1981). Instead, facilitative courseware aims at eliminating or reducing some types of "inauthentic labor" (Kemmis et al 1977) involved in language learning.

The third case history provides one example of a facilitative programme. The courseware is built around an off-the-shelf optical videodisc of a very popular film. The videodisc is not altered in any way, but is controlled by a microcomputer programme which will provide a wide range of assistance to students–but only when requested–at the touch of a key. Here, students take full responsibility for their own learning.

Some facilitative courseware, such as the video-disc-based material described above, lends itself to use by either individuals or groups of students. Another example of facilitative courseware is the use of word processing and spelling checker programmes in writing classes. Here, however, only one student at a time can use a computer system.

It should be emphasized that there may be a relationship between the sophistication of the computer system and the type of courseware that is feasible (Wyatt 1983). As mentioned previously, some important features of instructional programmes were difficult or impossible to implement with the limited memory of first-generation microcomputer systems. With such microcomputers, extensive score and performance recording can be achieved, but not easily. In a system designed by the author, for example, an entire diskette for each student is devoted to maintaining this information if the teacher decides that such an option is desirable. As a second example, intelligent answer-processing can be implemented on the older microcomputers (Pusack 1983). However, systems based on older microcomputers do not compare to the power and convenience of those based on mini- and mainframe computers.

As newer microcomputers with very large memory and storage capacities become available, this situation is now changing rapidly.

Similarly, the use of videodisc or videocassette players does not imply a facilitative approach. In fact, both instructional materials (Luckau 1983; Melendez 1980) and collaborative materials (Schneider & Bennion 1983) have also been produced. It would be quite possible to develop discrete-step, instructional listening comprehension materials based on the same videodisc mentioned in the third case history. For a thorough instructional approach to listening comprehension, however, it would probably be necessary to film carefully scripted scenes and create customized videodiscs or tapes — a much more expensive undertaking.

4 The proper role of the computer

In terms of the categories that have been identified, what is the proper role of the micro-computer? It seems clear that all three of the roles are potentially valid. Language learning is a field in which a very broad range of approaches is currently employed. There is no general agreement on precisely which methodology and what techniques are superior to all others. In fact, this has been the subject of fruitful debate at every professional conference I have attended and shows every sign of continuing indefinitely.

Why, then, should we attempt to prescribe some computer roles and proscribe others? Diversity in computer-based language learning materials is as healthy and vital as diversity in language textbooks and methodology. Ultimately there are two arbiters of the fate of educational materials. One is the teacher, selecting materials which best fit with personal convictions and styles of language teaching. The other is the student, responding to the materials made available and selecting those which fit personal learning habits and styles most effectively (Jones 1983).

The debate and controversy surrounding the different roles that microcomputers can play in language learning are testimony to the growing appreciation of the contribution this new technology can make. Rather than seeking to proscribe one approach or another, we should be concerned with ensuring that, whatever approach is selected, the courseware that is produced is the highest quality we can achieve.

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No one is born civilized or primitive.
The child of a civilized man and woman will never be a civilized being, if he does not acquire the necessary learning.
The child of a primitive man and woman will become civilized, if he is educated to be so.
The difference between a primitive man and a civilized one is not biological; it is educational.