Computers in Language Teaching

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Abstract

This paper explains what a computer is and how it is used. Furthermore, the roles of the computer in assisted language learning (CALL) as knower-of-the-right-answer, as workhorse, and as stimulus are discussed. This paper also outlines how the computer can serve the learner. It highlights the activities a computer can do, for example, drill practice, gap filling, multiple choice, CLOZE, text reconstruction, animation, graphics and jumble letters, words, sentences, text mazes, games and simulations. In addition, this paper mentions some software which is available for the activities described. Lastly, the article discusses the use of computers in teaching the four language skills: writing, reading, speaking and listening.

To most language teachers a computer is an innovation, and a 'computer room' has different meanings to different people. To a scientist it may be a room with giant banks of machinery with high technology, winding tapes and white laboratory coats. However, to a language teacher or learner, a 'computer room' is a place where learners are stimulated by a task and talk about it. Few language teachers would want to be computer scientists but many are interested in knowing how computers can be used in language teaching. These points will be examined in this paper.

First, let's try to answer the question: What is a computer? There are three main types of computers. Computers are referred to according to their size, from largest to smallest. They consist of mainframes, minicomputers and microcomputers. For language teaching in the classroom, the microcomputer and its programs are the most common. A microcomputer, which will now be referred to as a computer, consists of three main components – – the keyboard, the screen or monitor and the disk drive. The printer is an additional component used for printing information onto paper instead of onto the screen. It is essential when the computer is used as a word-processor. The parts mentioned are known as 'hardware,' and they run the computer programs or 'software'.

Software, which is sold on diskettes or cassettes, come with operating instructions and with some classroom suggestions. Software development is still in its infancy stage, and few language teachers are enthusiastic about this area for the moment. Programs which have been developed are produced by programmers who are not well versed in language teaching: therefore, they do not know how to apply them appropriately or how to integrate them into language teaching.

However, a more serious problem lies in the compatibility of the computer software. Software on the BBC computer will not function on an Apple or IBM computer. Therefore, when purchasing software one must be sure it is compatible with the computer at one's institution. Most publishers in Britain produce only BBC software which unfortunately is incompatible with what is used in most Asian institutions or elsewhere in the world.

The producers of software are beginning to realize the limitation of their market. I asked a representative of one publishing firm why they do not produce software in MS. DOS (IBM compatible) or Apple. His reply was that the language of the computer, although BASIC, is different for each computer and thus for a programmer to translate from one computer system to another is very painstaking and, of course, time consuming. He predicts that in another two years or so many of the language teaching programs will be published for different makes of computers. He also acknowledges that MS. DOS will eventually be the standard computer worldwide. Nonetheless, computer manufacturers in several countries are combining forces to produce a standard computer language. Until this task is accomplished, it is very important that the software one buys be compatible with the computer at one's institution.

Now that language teachers have some idea of what a computer is, let's examine the role of the computer (in language teaching), the activities it can do and lastly how it can be used in the four language skills (reading, writing, speaking and listening).

Jones (1987) has assigned three roles to the computer, including computer as knower-of -the-right-answer, workhorse and stimulus. Traditionally, in computer-assisted language learning (CALL) the computer presents, reinforces, and tests particular language items. The computer presents a rule and gives examples. Then, the computer tests the knowledge of the rules, gives the appropriate feedback and awards a mark. So the computer's role is that of a "quizmaster." The computer's role is now edging toward on becoming a "discovery device." This introduces a game-like situation in which learners compete against each other, against their own 'previous best score' or against the computer.

The second role of the computer is that of workhorse. The computer is a "writing machine." It uses a word processing program which can help learners improve their writing skill. It becomes a flexible writing aid and when the computer uses a database program it becomes an "informant." Lastly, the computer serves as a stimulus. It gives learners something to talk and to write about. However, bear in mind that the dividing lines are not clear-cut, and it is not always possible to assign a specific role to the computer in every instance.

The computer also serves as an educational aid, and one of its positive features is its interactive capability. That is, the computer pays attention to the learner at the keyboard and replies to him. It serves as a tutor, assesses the learner's reply, records it, indicates mistakes and gives explanations. It gives instant feedback and acts as a guide for learners to reach the correct answer.

Besides being a tutor, the computer serves as a play partner in educational games, or as a reference book. The computer permits learners to work on their own and at their own pace. It is beneficial for slow learners, as well as for those learners who have been sick and need to catch up on work. Furthermore, fast learners can use it to study extra material. Being a machine, the computer is patient, tireless, consistent and unbiased. The computer is able to do tedious and mechanical work like correcting simple exercises. Hence, the teacher can have more time to spend on preparation of other activities, such as role playing. The computer also keeps records so the teacher can have access to learners' strengths and weaknesses.

Activities

With CALL the learner normally communicates with the computer through a keyboard in response to a stimulus, displayed on the screen. The computer responds to the learner's answers and shows another stimulus and the process continues in this manner. The computer is able to present visual stimuli in a text or graphics and audio stimuli in weird noises and synthesized music.

There are a number of ways in which a computer can be used in the classroom. One way is to use it as an electronic blackboard. This use, however, involves restraints on the number of learners, the shape of the room and the size of the screen. Nonetheless, the machine is a teacher's aid and it is operated mainly by the teacher. At the same time, though, learners can be called upon to operate the keyboard in the same way they are called upon to write on the blackboard. A computer keyboard is the same as a typewriter. Both the teacher and learner can learn how to use a computer keyboard from a typewriter.

Furthermore, the computer gives immediate feedback and it reports the consequence of a decision. Learners are motivated particularly when trying to beat the computer. A computer can be used in group work with or without the teacher. The group will have one student as the keyboard operator and this role can be rotated. Lastly, a computer can be used by learners who are studying on their own.

Drill Practice. Many language teachers believe in the Socratic approach to language learning; that is, learners are given some information and questions are asked. The teacher questions learners, thus providing reinforcement for learners and feedback for the teacher. The learners have an active role. In this context, the computer can take over the teacher's role and perhaps, will be more patient than the human teacher.

For example :

tea	Is there any tea ?
milk	Is there any milk ?
oranges	Are there any oranges ?
or more 'meaningful' drills	
tea	Is there any tea in the pot ?
oranges	Are there any oranges in the box ?
money	Is there any money in the bank ?

Gap Filling. Gap filling is one of the most common traditional types of exercise and is easy to produce on a computer. Gap filling is suitable for grammatical exercises, as well as for vocabulary exercises in which learners pick the most appropriate words from a list.

Multiple Choice. This is another type of exercise which can easily be set up by a computer. The format is straightforward. The learner's response to a question requires one key stroke. The computer has no difficulty in analyzing an A, B, C, D or a 1, 2, 3, 4 input. The computer can be programmed to guide the learner toward the correct answer if a mistake has been made, thus employing the tutorial element.

Cloze. Cloze is the procedure in which every n^{th} word is removed from a passage, and with the use of a computer this is made simple. The computer deletes words at the interval desired, be it at every 5th, 7th, or 9th words without much extra effort on the part of the teacher.

Two ways a teacher can make use of a computerized CLOZE exercise are : 1) using the printer to produce printouts which are given to the learner or 2) the learner doing the whole exercise at a computer keyboard. Unfortunately, the drawback of the second approach is the computer. It cannot cope with acceptable alternative answers. Some examples of programs available for cloze include CLOSEWRITE and CLOZEMASTER.

Text Reconstruction. Text reconstruction is another type of cloze exercise. Instead of deleting every n^{th} word, the whole passage is replaced with blanks (– – – – – – – – –) representing the original words. Learners can read the text first and then the passage will disappear. Once the passage has disappeared and been replaced with blanks, the learners try to reconstruct the whole

passage. Each word correctly guessed will appear on the screen at the place it occurs. It uses a wide range of skills: prediction, distinguishing low and high frequency words, etc. Some examples of text reconstruction software are STORYBOARD, TELL-TALE, TEXTBAG and TEXT-FILL.

Animation. The language teacher or linguist can make use of this method through the moving of words or figures around the screen. Animation is used in many computer games and these are very popular nowadays. Most textbooks use tables, boxes and arrows to present the rules of word order. This can confuse the learner. On the computer screen, it is possible to show the verb and subject changing places, or to send the main verb, participle or infinitive to the end of the clause.

Graphics. Graphics are useful when they are relevant. Graphics can be used to focus attention on a particular grammar point or on vocabulary. Graphics are difficult to program and they take up a lot of the computer memory. However, many programs produce only simple recognition exercises with pictures. Although graphics are useful, still photographs or video films can also be used as graphics.

Jumble Letters, Words and Sentences. The computer jumbles the order of letters in a word, words in a sentence, or sentences in a passage. Learners are asked to reorder the sentences in the correct sequence. Learners are made aware of the markers and context of the passage. Sequencing and sentence sequencing are examples of this method.

Text Mazes. Text mazes is a method for learners to solve problems. A text maze consists of several short pieces of text. Each piece has a problem and a set of alternative solutions. Learners should find the path through the maze by choosing different solutions to the problem. Learners must get out of the maze as quickly as possible by reading the text carefully. Mazes are good for working on intensive reading and comprehension, whereas for group work they can produce discussions and arguments. An enormous amount of playing goes into a maze exercise.

Games. Drill-and-practice is controlled repetition with monitoring and feedback, and soon becomes boring in the language classroom. One way to avoid boredom is to turn a computer drill into a game. The challenge for learners to beat the machine makes a drill more exciting, especially since it provides immediate, objective feedback on success or failure on the screen. These are known as competitive games.

In a competitive game two learners work on an activity at the same time and compete against each other while the computer displays their scores. If it is individual work, the learner competes against the target score (highest score), a score which another learner had achieved, and tries to beat it.

For example, in a gambling format the learner has a certain amount of points and has to stake a certain amount. The computer sets the odds based on its estimate of the difficulty of the task. In addition, rules of established games are used, for example, BINGO. Quizzes within games is another approach in which in order to make a move the learner must give a correct answer. NOUGHTS AND CROSSES and SNAKES AND LADDERS are examples of this type of program. Then, there are strategy games in which learner and computer compete against each other, including word games and chess.

Simulations. Simulation is a general term to cover activities which involve decision-making based on data for realistic situations. It can be a scientific experiment, business transaction, role-playing, problem-solving task and so on. Some simulations are similar to case studies. Unlike games, simulation has no use for competitive scores; rather it involves making a decision or taking an action and following it through to an uncertain outcome.

There are two types of simulation: 'real-time' and 'moved based.' In real-time the action does not stop and the ending could be disastrous if the learner reacts too slowly or does nothing, as in SPACE INVADERS or FLIGHT SIMULATORS. The language practice comes through reading the instructions. On the contrary, in moved-based programs the computer does not make a move until the learner has made a decision. Learners can discuss their decisions. According to Higgins and Johns (1984), the first language may be used at this point and learners will eventually use the target language when they feel confident.

Furthermore, in role playing, learners adopt a role or an opinion which may not be theirs. So the activity involves resolving a clash of interest or attitudes. Learners are briefed with the role they are to take so they know which point of view to adopt. This also includes characteristics they are to act out. The computer is fine for presenting shared information to learners, but individual information must be given privately.

Story branching is a simple type of simulation of which ACTION MAZES is one example. Learners work in small groups and read a short text which presents a problem. At the bottom of the screen there are several possible actions. The group selects one and finds out the consequence, and then makes further choices in anticipation of finding a fruitful solution. In simulation learners learn the consequences of a decision they made; in other words, they are not simply told that their answers are right or wrong.

Adventures. The dividing line between simulations and adventures is not clear. Like simulations, adventures consists predominantly of descriptive text. The settings are decorated with fantasy, captive princesses, hoards of gold guarded by goblins or dragons, spells to be cast, monsters to be slain. Alternatively one can find adventures set in the Wild West or in a Star Wars future. The underlying scenario is that of exploring a maze. A number of obstacles must be overcome, and the player must do some serious thinking in order to overcome them.

Many of the programs are set in fantastic locations and may not be suitable for many EFL learners. This is because the learner may find unfamiliar vocabulary. However, there is one program The British Council has made called LONDON ADVENTURE. This program is designed especially for the needs of EFL learners and is set in a more true-to-life environment. MACBETH is another adventure which should appeal to students of English literature. It is a set of four character analyses based on the Shakespeare play.

Computers are able to keep a detailed record of learners' progress. Some programs keep a record of learners' every attempt and every question and exercise. Thus, the teacher can obtain detailed information of the learners' performance. In theory, the teacher can use the information for revising his/her teaching or for testing strategies.

Unlike a textbook or other printed material, the computer is a dynamic medium which learners can control. They are never sure of what will appear on the screen next. Presentation appears in any number of sequences. Competition makes learners interested in computers and many teaching skills can be practised.

Skills

Writing. The main difference between traditional writing on paper and using a computer to write is that when using a computer the words appear on the screen, are not lasting, and can be deleted. They are permanent only when they are printed on paper using a printer. Deletions or additions do not leave a messy blot. Due to these reasons those who are reluctant to write with pen and paper are freer to wrestle with redrafting originals without the messy blots or other tell-tale signs of errors. Hence, the final copy is printed out and presented in an acceptable form.

A computer is not a threat to writing; it is a powerful tool and a way of getting learners to use language in a new way. Writing with a computer consolidates speaking and listening. It shares with reading many activities such as gap filling, text expansion, manipulation and correction. Furthermore, it promotes exploration of sequencing or thinking through a process. The computer can focus on an important area with speed and accuracy.

Writing is an immense task, and with a computer learners have a way to convey a message to their reader, obey the grammar rules, use appropriate vocabulary, use correct spelling and so on. Programs which are relevant to writing include word processing. Learners are able to write short texts at the keyboard and save them on a disk. The task is made easier because the program allows learners to make changes while writing, to correct typing errors, to insert and delete words, as well as to change the order of sentences. Learners are only committed to a final version after they have finished it. They can reload the program a few days later, edit it, and then save it on the disk in its new form.

Word processors enable the learner to manipulate texts freely. The text is written into the memory of the computer rather than on paper so the writer is free from the shortcomings of pens and typewriters. The learners can play around with the text until satisfied and ask the computer to print the text using the attached printer.

Word processors are versatile, but not complex to use. For most language learners the basic word processor is sufficient; they use it to delete, insert, replace and search. One appropriate way for the teacher to use a word processor in developing writing skills is in guided writing. For instance, learners can alter the text in some way from present to past and complete a text or dialogue by adding missing prepositions or verbs, or missing words of speakers.

There is no need to be alarmed in a class which has only one computer. Not all groups need to be at the keyboard at the same time. One group can be working at the computer while the other groups are doing other things. These other groups can spend their time planning and making initial notes, consulting reference books, or editing on paper the printout from a previous session. The groups can be rotated and if the assignment is not finished it can be saved on the disk and completed later.

Reading. According to Moore (1985) there are 4 types of reading :

a. receptive reading—the more usual form where the reader takes in what is being read.

b. reflective reading—the reader pauses from time to time to think about what is being read.

c. skim reading—the reader establishes the subject and decides whether or not to read and where to begin.

d. scanning—the reader attempts to find a particular subject or point in the piece of text.

Most language teachers use reflective reading for comprehension exercises. However, computers are helpful in developing reading skills in three main ways. These are outlined by Jones (1987) :

a. incidental reading—reading a text for a purpose, such as completion of an activity.

b. reading comprehension—traditional question and answer are used and grammar and vocabulary are developed.

c. text manipulation—the computer manipulates a continuous text and learners are involved in a cloze structure of the context and grammar.

In incidental reading learners are required to read written information presented on a screen and to make decisions based on this information. Successful reading is, therefore, an important part of such an activity. An example of such an activity is a reading maze. Learners are required to read successfully in order to finish an activity. With a computerized maze learners cannot cheat or skip to the end. The learners progress step by step and are committed to the choice they have made. The program will keep a record of the number of choices the learner has made.

Learners have independence from the teacher and the teacher can focus on other problems. Traditional exercises are used, such as fill-ins and multiple choices. Like reading from a book, computer programs are able to focus attention on any reading area : meaning of words from the context, skimming and scanning a paragraph or focusing on general comprehension questions. Furthermore, they can focus on certain reading aspects which include pre-reading questions and prediction. These questions can be true or false, the truth or falsity being established only after reading the text. Then the text is shown to the learners and they continue with the exercise presented.

Another major area of concern in developing the reading skill is to train learners to read efficiently ; that is, to avoid reading every single word, and to read, instead, in 'chunks', skipping the inessential. A program in such an area is a timing element. Computers are ideal for timed reading since they can display a text for a limited length of time and this can be set either by the learners or programmers in advance.

Another program is manipulation of reading texts. This involves the computer mutilating a text in different ways and the learners restoring it to its original form. Jumbling or scrambling is a familiar notion. The idea is similiar to scrambling the elements of a sentence or words for learners to rearrange appropriately. Hence, the same applies to elements of a paragraph (the sentences) and the elements of a text (the paragraphs). With a Jumbler program learners can develop their sense of paragraph cohesion and structure by shuffling the order of sentences until they are coherent and follow a sequence. The paragraph will reorder itself on the screen as appropriate keys are pressed.

Moreover, jigsaw reading is another activity that can be programmed on a computer. Jigsaw reading with a computer is similar to the activity where a text on paper is cut into pieces of paper. However, with a computer there are no organizational difficulties because the organization of the activity is in the computer's memory. Furthermore, the presentation is neater and more attractive on a computer screen than on pieces of paper.

Speaking. In oral activities learners use the language they have learned to communicate with each other. Simulations, role-playing and discussions are examples of such activities. Using a computer simulation needs as much preparation and careful management as the conventional classroom simulation or role-playing activity.

During the preparation stage, the teacher introduces the program to the class, goes over new vocabulary, and reviews useful structures and functions. If there are several computers in the classroom the teacher can divide the class into groups and each group can work through the program at its own pace, either as a simulation or role-play. The teacher should monitor the groups closely to be sure that they are conducting the activity assigned. If roles are allotted to individual learners, then each learner is responsible for his part.

If the class is small and there is one computer, the teacher can monitor the whole activity. However, if the class is large, one group of learners can use the program while the others do something else. Another alternative is to include the whole class into the discussion by assigning roles to each group and a spokesman can report on the group's decision. Learners,

therefore, have a reason to speak since they need to communicate their opinion to other members of the group and have a context to contribute to. Such an activity may not be appropriate every week; perhaps once or twice a term is sufficient.

Follow-up activities can be conducted as written assignments, such as describing what happened in the group, or writing a newspaper article, a letter, or a report. The teacher can give learners feedback on the language they have used, and indicate whether it has been successful or not.

In a simulation, feedback is immediate from a computer and learners realize that the result comes from their decision-making. There is no arguing with the computer, or going back on decisions, and no cheating.

Listening. Teaching listening has not been fully developed in CALL. However, three areas have been developed which involve listening : 1. ear-training (pronunciation skill), 2. general listening comprehension and 3. specific skills, such as dictation and notetaking.

In the first area of ear-training, learners are taught to recognize and distinguish the sounds of a language. For example, in a diagnostic ear-training test minimal pairs or threes etc. are given. Learners play the cassette recorder, which consists of a number of test items covering several areas. The exercise is multiple choice for each question on the cassette : the possible words or phrases appear on the screen, and the learners select the one they think they have heard. The learners can rewind the cassette recorder and replay the tape again. The computer gives feedback, keeps a record of the errors made and recommends a suitable remedial program for learners. The exercises need not only consist of minimal pairs; they can be recognizing word or sentence stress, identifying the stressed syllable and indicating if an intonation is rising or falling. Computers are not good for understanding spoken words but they can analyze sound patterns and distinguish them from each other with attached equipment.

In conclusion, I do not wish to imply that the skills be practiced separately. Since most class activities are multiskilled, any attempt to divide them would be unrealistic. They are treated as such only to show the main emphasis of each skill. As has been shown, computers are useful teaching aids and, if available, can be used to stimulate teaching and lessen the burden on the teacher. Computers are new innovations in language teaching and can be used well or badly. Careful selection and preparation of materials, lesson planning, classroom management and training of both learners and teachers are crucial. Without these, computers would be useless; the essential element, as always, is the teacher.

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