George Krupnik

Alternative applications in second language teaching

Computer-assisted instruction in a second language should clearly fall in line with the best practice in language teaching if it is to play a really significant role. Illustrating his points in detail with short sequences of different styles of interaction between a student and a computer, George Krupnik demonstrates a number of crucial differences in potential between the programs now in existence. Some programs conduct language "learning", by monitoring the language a student has produced and applying to it the rules that have been expounded. Others, however, can support language "acquisition", that spontaneous and largely unconcious process by which thinking in another language is achieved - a development that aligns programming with the main principles of language learning now recognized to apply.

Computer applications in second language teaching make a controversial subject, that at present evokes more doubt than enthusiasm in the teaching profession. However, these applications are rapidly developing in response to previous mistakes. The goal of this article is to convey a feeling for the scope of such applications and their implications for teachers.

Of the many different approaches to teaching a second language in the classroom, perhaps it can be said that there is not any one best way. For many years computers have been used to analyse, compute, and manipulate materials, and have also been the base for many self-teaching systems. However the attitude of the profession towards the use of the computer in language teaching still remains very cautious, often with negative overtones.

In principle these feelings are quite understandable, considering the way computer-assisted language instruction (CALI) has been developing over the years. A close association

was established in many people's minds between the computer and the techniques of Programmed Instruction (PI). The subject index of Language Teaching and Linguistic Abstracts for the years 1973-1975 refers us to the entry "Computers: see under Programmed Instruction". Even as late as in 1981, Farrington, a linguist actively working in the field of CALI, had to admit:

"Computer assisted learning is essentially the same thing as programmed learning. This is a technique not widely used for language learning, largely because the principle of programmed learning, breaking down the material to form a series of clearly defined steps, did not suit most people's intuition of how language worked or what language was." (Farrington, 1981)

The usual assumptions made by teachers about the teaching role of the computer are closely related to their central assumptions about the nature of knowledge. In the first place, they assume that the computer will be used for the work in which the student and the machine are alone together. It is usually taken for granted that there will be "one student to one machine" (although very often students tend to group themselves differently, with two or three to each computer). Secondly, they assume that the machine is in control of the student. The standard model of interaction in this case derives from the teacher-centered classroom, only here it is the computer which is responsible for initiating exchanges, assessing students' responses, and providing feedback. The choices and initiatives open to the student are strictly limited, the role assigned to him or her is essentially passive, and the model of the language-learning process is to a great extent behavioristic, involving the reinforcement of appropriate habits in the target language. Major assumptions about computer software have followed from the concentration on this drill-and-practice type of activity.

Traditional programs

What do existing CALI programs based on this approach look like? A student is given a problem in the second language and asked, usually with a word or a sentence in this language, but occasionally with a translation, to respond. He types his responses into the computer, and the program compares them with the list of pre-stored anticipated responses. If the student's response exactly matches one of the anticipated responses, the program tells the student he is correct and goes on to the next problem. If the student's response partly matches an anticipated response, the program has the computer spell out a reply to the student in which the parts of his response which do not match anticipated response are left blank. The student is then asked to correct his sentence. This process is repeated until the student gives a correct response or until, after a certain number of tries, the program gives him the

correct answer.

In spite of the strong impression of computer power that some people acquire, and contrary to those authors who claim that in this type of interaction the computer is active while the student is passive, it seems that here both computer and student are basically passive. The only active element is the programmer, who is probably the only one who gets any fun, too. The computer is just a medium of instruction, it doesn't know the language, and it sees responses only as strings of characters. It can react to them only if the instructor has anticipated the strings of characters which occur as student input. Thus, strategies for anticipating and analysing possible students' responses largely determine the character of the interaction between student and computer. Therefore even the most sophisticated CALI programs, if they are based on this approach, differ only in degree from the simplistic exercises of PI.

The first three of the computer programs described below in fact reflect this structural behavioristic approach to language learning. However, as we will see later, they can be used advantageously in some situations where they are applied for specific purposes.

It is the characteristic of many programs that they begin with a chatty signing-on routine (Higgins, 1982).

PLEASE TELL ME YOUR NAME
John
HALLO JOHN. TODAY WE CAN DO EXERCISES ON
THE PLURALS, THE DATIVE OR THE PAST TENSE.
WHICH DO YOU WANT?
Past
YOU WANT THE PAST TENSE. IS THAT RIGHT? (Y/N)
JUST WAIT A MINUTE, PLEASE
HERE IS A SENTENCE. PLEASE MAKE IT PASTé
ICH WOHNE IN LONDON
Ich wohne in London
NO, THAT'S NOT RIGHT, I'M AFRAID. THE PAST
TENSE OF A REGULAR VERB IS MADE BY ADDING -T-
TO THE STEM AND THEN ADDING THE ENDING
FOR PERSON. PLEASE TRY AGAIN.
Ich wohnt in London
NO, YOU FORGOT THE FIRST PERSON ENDING
THE CORRECT ANSWER IS
ICH WOHNTE IN LONDON
NOW TRY THIS AGAIN
ICH LIEBE DICH

And so on.

As one may see here, in the signing-on part the student is offered three options about the exercises to be done. Basically it is a straightforward, structural, drill-and-practice type of activity, where the learner is guided to the right answer by a

series of Yes/No steps. One need not be taken in by the lengthy explanations and commentaries made by the computer. Their main purpose is to put the learner at ease and to create a more relaxed, classroom-like atmosphere, which the textbook obviously lacks and is unable to convey.

The next program, although constructed essentially along the same lines, tries to introduce the element of a little more skill and timing in the student's behaviour (Higgins, 1982). It is written for total beginners and uses the sentence pattern: "Name...is...in/from...place". The student is given an instruction by the computer: "PLEASE PRESS THE KEY IF A SENTENCE IS TRUE. DO NOT PRESS THE KEY IF A SENTENCE IS FALSE". Then the top of the screen displays a matrix of information:

NAME	FROM	IN
Mike	Liverpool	London
Anna	Bristol	London

The computer displays two examples to show right and wrong sentences.

Example: MIKE IS IN LONDON - This sentence is true: Press the Key. ANNA IS FROM LONDON - This sentence is false: Do not press the key.

You begin. A sentence randomly generated by the computer now moves across the bottom of the screen under this table, and learners have to press the key "to trap" it if it is true: MIKE IS FROM BRISTOl....ANNA IS IN LIVERPOOL....

As can be easily deduced, the displayed table provides four true sentences:

Mike is from Liverpool
Anna is from Bristol
Mike is in London
Anna is in London

But there are eight false sentences which can be generated by a random combination:

Mike is in Bristol
Anna is from London
Mike is in Liverpool, etc.

Students win points as they do this exercise, between twenty and thirty according to the speed of their reaction, but lose ten points if they trap a false sentence. Ten true sentences constitute one run of the game. The computer then displays their current score alongside the day's best score which they are trying to beat. The author of this program mentions that his teenage daughter and her classmates played it uninterruptedly for nearly three hours when he asked them to try it.

In a third program students are invited to make the choice between "a" and "an" articles before nouns and noun phrases (Johns, 1982). A word is displayed on the screen and the learner is requested to supply a proper article.

A DOG
A HOUSE
AN HONOUR
AN HEIRESS
A HIERARCHY
AN ACCIDENT
AN EVENING
A EULOGY
A USEFUL GIFT
AN UMBRELLA
A UKELELE
A UNIVERSITY
A UNIFORMED PERSON
AN UNINFORMED PERSON
AN S.O.B.
A SOB
AN X
A U
AN 800-METRE RACE
AN 11-METRE YACHT
A 110 ROLL OF FILM

The selected printout, which can be a part of a much longer list of words, shows that the program is sophisticated enough to distinguish between such "minimal pairs" as A UNIFORMED PERSON and AN UNINFORMED PERSON, between AN S.O.B. and A SOB, between AN 11-METRE YACHT and A 110 FILM. But these are included for especially bright students. The program may be offered as a test and drill exercise after the teacher's explanation of the underlying rule in class. Subsequent discussion is also very beneficial.

Features of the type

Now, what are the major features of this type of language program from a linguistic and teaching point of view?

It is obvious that the learning theory behind these teaching materials is closely derived from the programmed learning theories of Skinner and Crowder, and from more recent work of structuralists and auto-linguists who regarded language as a habit system acquired via stimulus response association. Some of the main points underlying this type of CALI program are therefore as follows:

1) The role of input data from the student is of prime importance; without it there can be no interaction between the computer and the learner.

2) The programmer regards the learner as a passive component in the interaction process.

3) The programs are explicitly rule-oriented; the thinking process underlying their concept is deduction. The rule is

usually explained in the class by the teacher; corresponding language forms are then drilled on the computer.

4) Language skills are isolated, in the sense that speaking and listening are rarely the purpose of such exercises (except when specific phonetic pronunciation drills are practised on the computer), although reading and writing (or rather spelling) often go hand in hand.

5) Language is usually taught from the bottom up; that is, the student progresses through small language units that gradually increase in complexity if the responses are correct.

6) Function and form are very often practised and emphasized at the expense of meaning and communication.

In fact, no matter how amusing and game-like the second program, for example, may seem, one can successfully argue that it might not be a language exercise at all. After some time the students may simply try trapping true sentences on a "hit or miss" basis, or mechanically correlating them with the appropriate places in the table without understanding their meaning. And this argument would be absolutely valid in this particular case.

However, it is very easy to criticize these programs - as it is not difficult in general to find lots of drawbacks in the underlying structural behavioristic approach - but the actual teaching process in a second language classroom inevitably involves a lot of exercise, drill-type activity, error correction, and so on. The materials described above help the teacher to take these activities off his hands and to use the time more creatively. They can be highly individualized and specific - the computer is a very patient driller, it never gets tired or bored with students as teachers sometimes do. It can move at the student's own pace and is incapable of ignoring or missing a mistake or lack of response. If an answer is incorrect the computer says so, and refuses to move on until a correct answer is given. In contrast to this immediate interaction and feedback, when comprehension is being tested by homework assignments students may wait at least a day to discover whether their understanding has been correct.

Therefore, perhaps one of the most distinctive features of CALI, including this first type, is the merging of teaching and testing into one single process. In traditional teaching there is a period of teaching, and then a period of testing. In CALI there are no separate teaching and testing periods. Most programs teach (as far as they can) and test at the same time.

The computer plays cloze

"Very well," many would say, "all this seems pretty optimistic and exciting, but show us anybody who has learned a language with the help of computer. Nobody has ever heard of such a person." And they would be right, because among other

things nearly all work on computer applications in foreign language learning has dealt with the morphology of the word or with phrase or sentence-level syntax, often devoid of context. While this one-way work was being pursued, the profession was discovering sociolinguistics and discourse analysis, functional-notational syllabuses, and communicative methodology. All of these developments emphasize units longer than the sentence and deal with divergent and unpredictable language. The computer, despite its apparent sophistication, is still nothing but a machine which cannot handle any novel inputs which the programmer has not foreseen.

Accordingly in recent years some have begun to think of other ways for a language teacher to use the computer than merely to issue prompts and to evaluate responses for accuracy. Research groups of the English Language Teaching Centre of the British Council have been among those exploring alternative computer applications in second language teaching. The three goals which they laid down for their work were formulated by Tim Johns from Birmingham University:

1) Priority should be given to materials based on texts longer than the simple sentence or the isolated word.

2) Programs should be made as game-like as possible, students being challenged to pit their wits against the computer; and

3) The instruction should be computer-generated, in the sense that questions or problems should not be constructed by the programmer in advance and placed in the program; they should instead be constructed by the computer itself in response to the moment-by-moment state of play between the computer and the student.

It is obvious that the third goal is very difficult to achieve from the technological point of view, because it borders on ideas of "machine intellect." A bold attempt to implement some aspects of computer-generated instruction will be discussed later.

Before coming to sophisticated programs it is worthwhile to examine some less elaborate ones. Their goal is developing and checking learner's comprehension and emphasising certain grammar and vocabulary points. They were written specifically for English as Second Language (ESL) classes and are available for use and reproduction. One category aims at helping students to develop reading skills, and is based on the idea of mutilating the text and inviting the student to restore it. The main interest of these exercises, which are well known under the name of "cloze tests", arises from the fact that a learner must call on information at higher than the word or sentence level. A much more primitive version of these exercises has been known and practised before in traditional textbooks (fill in the blanks, complete the sentence, etc.), but a very important advantage of the computer cloze over the traditional

printed-text cloze is that the computer will allow several attempts at each answer, prompt the student after a failure, initiate a game-like activity, and serve as a party in the competition. This rather general advantage that the computer has accounts for much of its motivating power.

Before looking at a concrete example of a cloze program, it is pertinent to describe in a few words two other interesting cloze exercises which involve elements of a gambling game. The first, called "Masker", was written by Tim Johns and is probably the most interesting in his series of these activities. Here the screen presents a layout of dashes and punctuation, a text from which every letter has been deleted. At the foot of the screen is a comprehension question, the answer to which is somewhere in that invisible text. Now students have the chance to "buy" pieces of the text from a notional capital. The computer may offer them, at different prices certainly, the first sentence, the last sentence, the first word of every sentence, the first letter of every word, all the vowels, all the words of three letters and less, the five longest words in the text, or a specific word that they point to by moving the cursor on the screen. The goal of this game is to restore the text, spending as little money as possible. Intelligent learners soon discover which options lead most quickly to the answer they want, and, therefore, which parts of the text have the highest information content.

The second exercise of this type, called "Storyboard" (Higgins, 1982), also carries the severest form of mutilation, as the complete text is deleted. The procedure is as follows: First the computer displays a graded list of numbered titles, each referring to a certain passage; the low numbers are the easiest. Depending on the degree of difficulty she wants, the student chooses the number of a passage, and then the computer asks her for how long she wants the passage to be displayed on the screen. There are several options: 1) for as long as wanted; 2) for 30 seconds ; 3) for 10 seconds; 4) not at all. If the student chooses options 1 to 3, she will see the complete passage of about 100-120 words displayed on the screen for the indicated time, and if she chooses option 1 the passage will stay on the screen until the key is pressed. Next the screen blanks out, and in place of the passage the student sees dashes and punctuation marks. A line is drawn across the screen below the passage, and the student is prompted by the computer: "Guess a word..... Type XXX if you are stuck". If the word the student guesses and types in really occurs in the passage, she will see it being printed on the screen in all the right places in the text. (Of course, the student is not making completely blind guesses. She can begin with any words she remembers from the first reading or with words which are suggested by the title.) She can fill in any of the short, common words which she thinks may be used, words like "the", "of", "is", "some", "that", etc. At any time that the student is stuck she can type "XXX" and the next word will be displayed in all the right places. In this

way the student gradually builds up the complete passage.

The example given below is of a cloze exercise designed to check reading comprehension in an ESL class (Harrison, 1982). It can be used with adults at an intermediate level. First the screen displays a short passage, which can be a part of a longer text.

"I once ---- back from - skiing trip ------ to find ---- a snow storm --- fallen at --- airport and ---- the door ----- on all --- cars in --- car park ---- frozen -- that it --- impossible to ------ a key."

The students are then given the instsruction: "Please read the text and fill in the blanks with the proper words. Hint: Each dash represents a letter, for example, 4 dashes (----) stands for a four-letter word. The student then types in a word:

come
No, bad luck, try again
came
- I ONCE CAME
a
- I ONCE CAME BACK FROM A
abroad
- I ONCE CAME BACK FROM A SKIING TRIP ABROAD
that
- I ONCE CAME BACK FROM A SKIING TRIP ABROAD TO FIND THAT
was
No, bad luck, try again
have
Still wrong, give it another try
had
- I ONCE CAME BACK FROM A SKIING TRIP ABROAD TO FIND THAT A SNOW STORM HAD
the
- I ONCE CAME BACK FROM A SKIING TRIP ABROAD TO FIND THAT A SNOW STORM HAD FALLEN AT THE
door
No, bad luck, try again
locks
Still wrong, give it another try
windows
Bad luck, the word is:
- I ONCE CAME BACK FROM A SKIING TRIP ABROAD TO FIND THAT A SNOW STORM HAD FALLEN AT THE AIRPORT AND THAT
locks
- I ONCE CAME BACK FROM A SKIING TRIP ABROAD TO FIND THAT A SNOW STORM HAD

FALLEN AT THE AIRPORT AND THAT THE DOOR LOCKS

And so on.

In this exercise students are given three tries and three corresponding prompts; if unsuccessful, they are then given the right answer. Despite its obvious attractiveness, this program has some minor disadvantages, the first being the choice of the text itself. When selecting passages for cloze tests particular caution should be exercised to avoid ambiguities and words which fall out of the general context. The word "abroad", for example, seems extremely difficult to guess, because it doesn't carry any informational load, and students might feel justifiably puzzled and frustrated when after three unsuccessful attempts they see it printed on the screen. But in all other respects the program is done skilfully enough and can be refined even more by deleting verbs, say, to check knowledge of tenses - or prepositions, or articles, etc. All this is up to the instructor and may be very individualized with respect to particular students.

Distinguishing between learning and acquisition

Now, what are the learning effects and implications of this kind of activity? First of all, the student is forced into very accurate thinking, since the computer will not accept a spelling or grammar mistake. The student is also forced to use all the clues about meaning that are available to her, resorting not only to her knowledge of vocabulary and grammar, but also to her common sense. Since the obvious goal here is meaning, the student will be trying both to grasp the meaning of the passage and to find proper grammatical forms and structures in order to convey it. In the process of building up the text she will practise and develop skills in using language redundancy - the way that words tend to combine and suggest what is coming next. This would seem to improve her inferencing abilities and is a good measure of grammar expectancy. In short, this activity will improve skills for both slow careful reading and rapid extensive reading.

Although these programs clearly represent a step in the right direction, because the emphasis is on meaning rather than on form, they still offer no more options to the student than "true" or "false", and any novel response which does not match the instructor's anticipated answer will be considered by the computer as incorrect. They are still rather rigid, and the student doesn't have sufficient leeway to practise the language. Van Campen pointed out that, despite their usefulness and motivating power, even the exercises of the last type all address themselves to the conscious process of language learning and "offer very little language environment for acquisition." (Van Campen et al;, 1980)

The distinction between learning and acquisition has become important since Corder's paper on student errors, and was later developed and refined by Stephen Krashen, who introduced the monitor theory. Krashen argues that "learning" does not originate spontaneous speech, but acts as a monitor on it. All of the previous programs have been concerned with "learning", a deliberate process of rule application and memorization in a linear syllabus, using a convergent language and discourse which lacks "uncertainty of outcome" - an essential element in communicative processes. "Acquisition", on the other hand, is a largely unconscious process, which works both on convergent and divergent language. It is pertinent to stress in this connection that discourse and teaching materials, or exercises of the "learning" type, do not necessarily reflect features of the computer alone; certain quizzes and exercises given by teachers in class do impede, explicitly or implicitly, the emergence of variant answers. For example, the author of the program examined below describes an episode he saw in class, where the teacher was drilling "Yes, I am", by asking questions round the class: "Are you a girl?", "Are you a student?" and so on. She asked one small boy, "Are you sick?". The boy looked puzzled and said: "No, I not sick". "Wrong." the teacher cried, "You must say 'Yes, I am."

From all this it seems clear that the conventional approach to CALI has often been directed towards the learning rather than towards the acquisition process. The program described below attempts to focus on linguistic features, but would favour acquisition over learning. There are a number of possible ways of doing this, one of which is simply to turn the learner's attention away from language manipulation towards some external communicative task, a game, a problem-solving activity, or a simulation.

The following program, called "Grammarland", was written by John Higgins (1982) and is intended to be a series of dialogue simulators. Here the display holds four small captioned pictures each showing a name, a profession, and an activity unconnected with the profession.

Jim, the taxi-driver, is watching television.
Maria, the tennis champion, is playing the guitar.
Susan, the novelist, is playing tennis.
Bob, the maths teacher, is driving to school.

Then the computer prompts the student:

PLEASE LOOK AT THE PICTURES, READ THE CAPTIONS,
AND ASK ME SOMETHING
What is Susan?
SHE IS A NOVELIST.
Is she writing a novel?
NOT AT THIS MOMENT.
Who is watching TV?

JIM IS.
Who is singing?
I'M SORRY. I DON'T UNDERSTAND SINGING.
Who is teaching?
NOBODY.
Does Bob work a taxi?
THAT'S A FUNNY QUESTION.
Does Bob work out of doors?
NO, HE DOESN'T.
Does Bob play tennis?
PERHAPS. I DON'T KNOW.
Ask me something.
DOES MARIA PLAY TENNIS?
Yes, she does.
I AGREE.
Ask.
DOES JIM WATCH TELEVISION?
No.
MY ANSWER IS: YES, HE DOES.
Ask.
WHERE IS MARIA?
Answer.
SHE IS INDOORS.

This program has several points to distinguish it from traditional drill-and-practice exercises. In the first place, the computer is completely neutral as to whether it asks, answers, or does both. It is not dealing purely with Yes/No values (or their equivalents), but will also handle "Perhaps", "Probably", and "I don't know", in cases where these are semantically appropriate. The teaching point here is to provide an insight into the semantic difference between present-simple and present-continuous, and to do this by always providing answers which are true for the characters on the pictures. It is not a really communicative computer exercise yet, because no computer environment is able or will be able to simulate the creative ability and personal impact of a human teacher, but it does demand that learners relate the linguistic code that they are using to a set of non-linguistic facts, and is indeed very motivating and fun.

It may be argued that there is no place for unanticipated answers in this program, since the computer will consider any kind of novel response as an error, or stop each time the student commits a typing mistake, thus impeding really unrestricted communication. But simulation programs of this type are capable of ignoring a certain category of errors should the programmer wish. He can, for example, instruct the computer to ignore spelling and typing errors, correcting only those which are contrary to the meaning of the passage.

One of the many special features whcih Higgins built into the program is that when the student presses the "enter" key without typing anything, this empty input is always interpreted

by the computer as the command "Ask" or "Answer" according to the context. In this way the learner can simply watch while the machine has a conversation with itself, and then join in at any point. He is not faced with a fixed set of examples as in the usual drill-and-practice exercises, and then obliged to respond. The computer is capable of generating its own examples as long as its memory input affords it and as long as the student demands it, choosing to watch the machine talking to itself. He or she can intervene at any moment to see how the computer will respond, or even try to make it commit an error. This freedom of action and choice seems to minimize aspects of routine learning and favour the processes of subconscious acquisition.

The main features of CALI programs of this type are, therefore, as follows.

1) They are aimed at both knowledge of language itself and some aspects of communicative competence (as long as this is possible to achieve within the restraints and limitations of present-day computer technology).

2) Although the role of input data is still of paramount importance, the role of learner has changed: it is more active, and learners themselves often provide input to the computer.

3) The material is only implicitly rule-oriented.

4) The program improves a learner's ability to infer and places him or her in a situation that has the uncertainty of outcome found in real conversation but missing from traditional textbooks.

5) The emphasis is clearly on both meaning and form.

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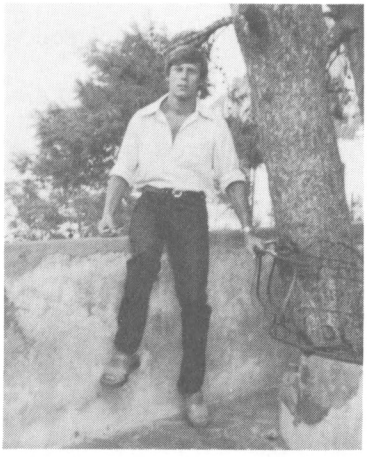

George Krupnik is interested in the possible applications of computers in second language teaching, having a background in programming as well as being a research assistant in the Department of Education in Second Languages at McGill.